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# RELATIVE FUNCTIONS OF STATE AND LOCAL HEALTH DEPARTMENTS

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Read before Section on Public Health Administration, American Public Health Association, at New Orleans, La., October 28, 1919.

**City health work antedates that of the state by about fifty years. The municipality is the powerful agency for local improvement through intensive cultivation of community interest. The state should care for legislation, health surveys, demonstrations and research, and should supplement local appropriations, but municipalities should control their own health administration.**

THE fact that this subject is one on which state and local health officers do not often agree, is probably responsible for the action of the Chairman of this section in passing it along to one who is neither a state nor local health officer. I realize fully that in attempting to present my own views, I shall probably risk the disapproval of some of my hearers; but, if out of the discussion which may follow, some, at least, of the principles can be established on which the relation of state to local health departments should be based, I shall feel that the risk was well taken.

I do not think that any one can say definitely what these principles are or ought to be. The times are changing, and there is a growing tendency throughout this nation and other nations for governments to assume greater and greater responsibility for the individual, as well as the community welfare of its citizens. The adoption, in many states, of state controlled health insurance, and its active and aggressive promotion in others, illustrates very well this tendency. How far this movement will go remains to be seen; but as the relation of the government to the individual changes there is invariably a change in the relation of citizens at large as represented by the state, to smaller groups of citizens as represented by local government units. In the midst of such kaleidoscopic changes in the relation of governments to people it would be folly to be dogmatic. What seems reasonable and proper today may be found to be the mistake of tomorrow. I can only hope, therefore, to present for

your consideration certain phases of the problems as they appear to me to affect public health administration at this time.

Public health work in this country began in the cities and towns, and in certain of our larger cities we find evidence that constructive health work was being done very early in the nineteenth century. As far back as 1805, New York City had a board of health of which DeWitt Clinton was president. The reports of the activities of this board make very interesting reading. Dr. Charles F. Bolduan, former Director of the Bureau of Public Health Education of the New York Health Department, and now Chief of the Section on Public Health Education of the United States Public Health Service, gives an excellent resumé of the health administration in New York City in a monograph entitled "Over a Century of Health Administration in New York City," which may be obtained from the New York City Health Department. We learn, for example, in Dr. Bolduan's monograph, that in 1805 a special committee of this board of health submitted a very comprehensive report on health conditions in New York City, and made recommendations relative to the provision of an ample supply of potable water, construction of common sewers, drainage of marsh lands, construction of a sea wall along the city water front, the planting of trees and healthy vegetables, interment of dead bodies, prohibiting the habitation of damp cellars and the use of certain houses in which deaths from malignant fever had occurred, provision of increased hospital accommodations, and better control of port quarantine.

Municipal health work thus antedates state health work by at least fifty years, for it was not until 1855 that a state board of health was created in Louisiana. But this board concerned itself chiefly with quarantine, and had, at that time, no general health program or policy. About ten years later, in 1869, the State Board of Health of Massachusetts was established and began to develop what was for that time a broad public health program. In the following 50 years, state health departments or state boards of health were established in all states.

In its beginning, therefore, and up to the immediate present, public health work in this country was especially a function of local government, and full credit ought to be given to local health boards and health officers for putting the United States on the public health map. The interest which has been aroused in public health throughout the nation is the result of the educational work done chiefly by local health departments and state health departments have relatively little share in the credit. The individual initiative of local health officers has made public health service what it is today. Chapin of Providence is responsible for revolutionizing our ideas of contagious disease work; Darlington of New York City has the credit of establishing the first bureau of child hygiene in this country; Goldwater of New York established industrial hygiene work as an essential local public health service; Levy of Richmond should be credited with demonstrating the importance of proper disposal of excreta in the prevention of diarrheal diseases of infants; Goler of Rochester was far ahead of his time in providing effective measures for the control of venereal diseases and for the supervision of midwives. It is not necessary to go farther with the list; simply add the names of hundreds of other local health officers whom you know who are scattered through the cities and towns of the United States. No disparagement of the excellent work done by many state health officers is intended, but you will no doubt agree with me that the national public health movement is chiefly the result of the intelligent and progressive work of local health officers. They have put their stamp upon it in no certain way.

As indicated, there is a general ten-

dency toward centralization of responsibility for public administration in both national and state governments. The movement for the creation of a national health department is on its way and it appears that this meets with the favor of the majority of public health executives and workers. Nationalization of health service in England is now a fact accomplished through the creation of a ministry of health with county health officers under the direct supervision of the Minister of Health. In the field of state health administration in the United States there is also ample evidence of this trend toward strong centralization of the public health service under state control. New York State as early as 1913 following in general the Massachusetts plan, enacted a law which provided for the creation of twenty or more districts, excepting cities of the first class, each under the supervision of a sanitary supervisor, appointed by the health commissioner of the state on the basis of a civil service test. These sanitary supervisors were not, however, made directly responsible for the organization and development of local health work within their districts, but were authorized to cooperate with and assist local health officers in the discharge of their duties and to make certain investigations outside the jurisdiction of local health units. The tendency of the present day is clearly toward this type of organization and toward even a stronger centralization of authority and responsibility in the state health department.

The recent laws of Ohio and Vermont, with which you are familiar, are excellent examples of this movement toward state control, which has been carried by these states still farther than in New York State. These more recent plans for highly centralized state control meet with the approval of many health executives who have despaired of securing efficiency of local health services under the old plan of part time service, political meddling, inadequate appropriations, lack of uniformity of procedure and general incompetence. In this movement toward centralization under state control there appears to many a broad beam of hope and proposals are now being made in other states for the adoption of the plan of centralized control as in Ohio and Vermont. Certainly these plans have much in them which is commendable. They do fix responsibility for health work and they do guarantee, in a measure, that the failures of local health services will, at least, be revealed; and that those who fail as leaders will be held responsible for their failures.

It would be presumptuous for me to criticise the laws of Ohio and Vermont and the similar laws proposed for other states; but there is a phase of this movement toward strong centralization which I feel has not been given sufficient consideration. I am a "Home Ruler" and a believer in the principle of self-determination, possibly because of my Irish extraction. With such convictions, I feel naturally, that the gain which we may make in strengthening state health departments and in centralizing all health work under the control of the state, if truly a gain, is not unaccompanied by loss. Experience under centralized state control only can determine whether or not this view is correct, but over-centralization of control of local health work in the hands of the state must certainly mean limiting the initiative of local communities. It also means, I believe, a loss of community spirit and individual enterprise. The most efficient local health services in this country today, at least within my own knowledge and experience, are those which have been developed through the intensive cultivation of local or community interest in health matters. The American Red Cross, looking about for other fields to conquer, has stepped into the public health field and is attempting to capitalize this community spirit for the develop-

ment of a very ambitious health program. The National Social Unit Organization which met in conference at Cincinnati recently, has the same purpose in view. As expressed in the prospectus of this organization, the movement is toward a "coöperative democracy in which all the people study their own needs and meet them through their own organized effort." Whether or not we approve of the public health activities of these private agencies, we must admit that they have seized an opportunity which most health executives have ignored.

Every citizen, whether he is willing to admit it or not, has a pride in his community. Perhaps his pride is not a justifiable pride, but nevertheless he has it. Our town government, our city government, our country government, is to most of us a personal and tangible thing, but the state is a nebulous thing which does not immediately concern us. Every change in government which takes us away from this real, personal and intimate contact and control of our own community affairs means a loss of that more or less indefinite thing which is called community spirit.

The record of work done by our United States Public Health Service in rural sanitation in the South illustrates very well what power may be exercised for the public health and welfare by the development and encouragement of community spirit. No high-powered, high-geared machinery of centralized control in Washington or elsewhere could have accomplished in such a short space of time and at such small cost what has been accomplished through the health demonstration work of Dr. Lumsden and his assistants of the United States Public Health Service. They sought not to force a health program upon a community, but to demonstrate health needs, and ways of meeting such needs through community coöperation. There was an appeal to the community "get together" spirit which brought immediate results in the correction of unhealthful conditions, and in the formation of permanent and efficient local organizations to carry on the work after the officers of the Public Health Service had gone.

Admitting the inefficiency of local health services, admitting the lack of uniformity of procedure, admitting the too frequent hampering of local health work by petty local politics, there is no assurance that centering complete authority in the state is the only remedy or even the best remedy. I am not willing to concede that we would have progressed more rapidly along public health lines if we had long ago adopted the now widely acclaimed plans for state control of local health work. On the contrary, much of the splendid pioneer work which has been done by local health officers with full responsibility for their own communities' health would not have been done. The all-powerful state organization toward which we are tending will tie the hands of the local health officer, make him largely a rubber stamp and blight individual and community initiative. I do not contend that this has been done in the states which I have cited for purposes of illustrating this tendency toward state control of health administration, but I do contend that we would do well to take thought of this matter. Definition of the basic principles upon which the relation of state to local health services should be established is a subject worthy of consideration by the best minds of the American Public Health Association. It may be that strongly centralized state control is the right thing, and a thing that we should all support whole heartedly, but there are certainly some limitations upon the right of the state to control local health work.

In order that my paper may not be purely negative in its treatment of this matter, I shall summarize briefly what seem to me to be the essential functions of a state health department. The functions of local health authorities may then

be considered as all not specifically mentioned as responsibilities of the state.

The first responsibility of the state health department is legislation. There must be, of course, some basic health law which will be applicable to all local units of the government. It would not be proper for me to forestall the report of the Committee of the American Public Health Association on uniform health legislation, but as a member of this Committee, I can say that the guiding principle in the work of the Committee has been to limit itself to broad health principles in drafting a uniform health code, with the idea of leaving it largely to the local health authority to work out the most effective method of applying such basic law to his own community. This to my mind is most essential, for our modern conception of municipal health work is based largely on the methods and procedures developed by pioneers working alone in their own local fields and able to think and act with freedom according to their own convictions. The state health authority should have the power, and it should be its duty, to promote the enactment of public health laws covering broadly all local health work, but it should not so define and detail local procedure that the local health officer does not have to think for himself. He will be a better health officer if he does think for himself, and the community will be a better community if its powers of initiative are not too greatly curtailed.

The second responsibility of the state health department in relation to the local health department is to make surveys of local health administration. Just as the United States Public Health Service sends its officers on request into local health departments to survey their activities and make constructive recommendations, so the state health department should be prepared to make expert surveys of the local health services of the state. The state should be even better able to do this than the United States Public Health Service, because it is familiar, or ought to be familiar with local conditions; and it is familiar also with the general and special laws of the state which govern the activities of the local health departments. The survey method should be applied also by the state health authority in rural districts where no organized health service exists. The facts obtained through the survey, if made known to such rural communities, would go far toward providing the needed service.

The third important duty of the state is health demonstration work carried on along the same lines as the demonstration work of the United States Public Health Service and as Dr. Dowling has so effectively done in Louisiana. The importance of this work in developing that community spirit and enterprise of which I have spoken cannot be overestimated.

Research is the next important function of the state health service and one which has been neglected in many states. By research I mean not only laboratory research, which is of prime importance, but research in child hygiene, tuberculosis, contagious diseases and all other lines of health work, for the purpose of developing facts which local health boards cannot develop except in a very limited way. The results of such research work should, of course, be made available to all local health departments.

The establishment of standards of record keeping and procedure is another responsibility which the state may well assume. The establishment of standards of accounting procedure, standard record forms for recording vital statistics, facts regarding health inspection, investigations, etc., would be of great value to local health departments. The adoption of such records should not be obligatory for local health departments, but if the standards are well devised and helpful to the local health officers, they will be

quite likely to adopt them. They will be even more likely to adopt them if standard record forms are furnished them by the state. Uniformity of record keeping is a long step toward uniformity of procedure and increased efficiency of service.

The state should also be prepared to furnish special service when called upon to do so. It should be prepared to send an expert diagnostician to the local health department when one is needed; it should be prepared to furnish a sanitary engineer to advise the local health authority with respect to water supply, sewage disposal, disposal of garbage and refuse, and other matters requiring technical engineering knowledge; it should be prepared to send an epidemiologist to investigate outbreaks of disease in local communities and assist the local authorities in controlling them. In short, the state should be prepared to furnish, on request, any special service which the local health department may require.

The state should conduct an efficient laboratory service which may be freely available to local health units for diagnostic work. It should encourage the establishment of local laboratories wherever possible; furnish free, or at cost, sera and vaccines, which it should make in its own laboratory; devise standards of laboratory technique and procedure which may be available to local health laboratories; and finally, as already suggested, conduct special laboratory research and make the results of its work known to local health authorities.

The state health department should also be responsible for conducting periodical conferences of local health officers, at which the local health officer may be given an opportunity to hear his own voice. Such conferences should not be conducted with the view to giving some noted health authority an opportunity to utter health platitudes, but with a view to finding out what the local health officer thinks about his own job, and in order to give the state health authority an opportunity to get acquainted with the workers in the vineyard.

Another important service which the state health department should render is that of conducting special courses for local health officers. This work has recently been undertaken by the State Health Department in New York and has proved a success from every point of view. This same thing can be done in any state and at comparatively small cost. If instruction can be given free so much the better, but many local health officers would be glad to pay the cost.

Education of the public along general health lines is an essential function of the state health department. Bulletins, pamphlets, boiler plate material for the press, and particularly the rural press; traveling exhibits, special lecture service where desired—all of these activities can be carried on most successfully under state auspices. The state could well afford also to supply printed educational material to local health departments for distribution under their own imprint. The effectiveness of propaganda would be greatly increased by such procedure.

The state health authority should be the scorekeeper for local health departments. Having established standards of service and encouraged in all possible ways the adoption of such standards, the state authority could stimulate competition between local units by presenting comparative scores. The community which found itself a tail-ender in the health race would be likely to inquire why, and having found out why, would in all likelihood take the necessary steps to get out of its unenviable position.

Finally, the state should be able to aid local health services through supplementing local appropriations for health work, in the same way that the Federal Government makes grants to states for certain agricultural projects, and as the United States Public Health Service has recently aided the states in the venereal

diseases campaign. The Ohio law also provides for subsidy of local health services by the state. Could this be done in all states the problem of raising the efficiency of local health services would be largely solved, for the state could then set the conditions upon which the allotment of funds would be made. It was this system of conditional grants of money which resulted in the establishment of Carnegie libraries from one end of the country to the other. Communities found themselves able to raise unheard of sums of money when they found they could get an equal amount as soon as they had raised their own share. It is too much to hope that this system can be universally effective for the improvement of local health administration except by the Federal Government, and provision should be made in any bill for a national health department for conditional grants to states which the states in their turn can apportion conditionally among the local health units.

Perhaps I have not covered all the services which the state should render to local health units, but if I have presented the idea clearly enough you can fill in the gaps. As you see, my ideal state health department is one that legislates along broad lines; advises, coöperates with and assists local health services in every possible way, educates its local health officers and the public, and is at the service of the local health department whenever it needs service. It is a state health department which seeks to stimulate and encourage local community spirit and enterprise and not to limit unduly or stifle such spirit. It is not an over-centralized, impersonal, all-powerful machine for state-wide control of health work, but a community service station prepared to meet community needs and to coöperate splendidly in meeting them.

In conclusion, may I suggest that, if it is the sense of this section, a special committee of the section or of the Association as a whole be appointed to consider this problem of the relative functions of state and municipal health departments, and to make recommendations which may be the basis for future legislation.

□

**Des Moines Health Center.**—The city of Des Moines announces the establishment of a health center, which as the announcement of the opening states, "is owned and managed by the people of the city and Polk County, for the benefit of every one in the community." Its purpose is set forth as being, "To keep the well well, to treat the ill, to remove 100% of all remediable defects and to co-ordinate health agencies." On the downstairs floor of City Hall in Des Moines the new center has been located in a number of rooms grouped about an entrance hall, which serves for waiting room and for recording and filing offices, while in the adjoining offices are the staff and equipments for various clinics and laboratories. The services which are to be maintained here include a medical clinic and dispensary, a psychological clinic and a child conservation service, intended for the study, treatment and supervision of children hampered with remediable chronic physical and mental ailments. Interested in the center and indeed its mainspring is a Health Center Association which is really a federation of local public spirited societies. There are a dozen of these, Polk County Medical Society, Methodist Hospital, Women's Clinical Society, Public Health Nursing Association, District Dental Association, Council of Social Agencies and the city government, schools, courts, etc. The interest of the courts comes through the fact that so many of the cases of backward children are brought forward here. Twenty-five of the city physicians are sufficiently interested to be conducting each a free clinic in his specialty.

# REDUCTION OF DEATHS FROM INFANTILE DIARRHEA BY CARE OF THE BOWEL DISCHARGES OF INFANTS*

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(Formerly Chief Health Officer)
*Richmond, Virginia*

Read before Section of Public Health Administration, American Public Health Association, at New Orleans, La., October 27, 1919.

**Utilizing the principle that care of bowel discharges is the most important single measure for the control of fatal infantile diarrhea in the South, the Richmond authorities have reduced the mortality from this cause from 150 per 100,000 in 1911 to 36 in 1919. Public health nurses have done this through health education of the family.**

CONCLUSIONS reached in the following paper were arrived at from work done for the control of infantile diarrhea in the City of Richmond during the past 13 years. The writer wishes to make it plain at the outset that, in connection with the epidemiology of many diseases, geographic location comes strongly into play. Conclusions which are reached must, therefore, for the present, be regarded as having particular application to Southern cities, exactly as the rôle of the privy in the control of typhoid fever is of special importance in that section of the country.

Furthermore, for the sake of exactness, it should be stated that the conclusions which are reached relate particularly to *fatal* infantile diarrhea, for, although since 1911 the morbidity rate has declined equally with the death rate, infantile diarrhea in Richmond was not reportable until that year, and hence morbidity data are not available for comparison prior to that time.

From 1909 to 1911 one thing after another occurred which pointed directly to the importance of infection as the chief element in fatal infantile diarrhea in Richmond. Within the limits of this paper I can give only one or two examples.

In March, 1909, there were four deaths from infantile diarrhea in the entire city. Of these four, three occurred in a single institution—the Virginia Home for Infants. In this institution there were at that time only about 30 babies. The three deaths occurred in one group of eight babies who were under the direct supervision of one nurse. There were neither cases nor deaths among the other 22 babies in the institution. The milk for all babies in this institution was received from a single source and prepared by one nurse. Evidently, therefore, the milk was not responsible.

Upon looking further into this matter, it was found that there had been a mild case of infantile diarrhea in the group of 8, but that the nurse was one who had only recently come to this institution. The Superintendent of this institution had had thoroughly impressed upon her the fact that infantile diarrhea must be regarded as an infectious disease, and that the diapers of all babies suffering from this disease must be specially disinfected. This nurse, being new, did not report the mild case nor give it any spe-

*At the request of the author, publication has been postponed until complete figures for the year 1919 were available.

cial attention. In consequence, three other babies in this group of 8 contracted the disease and died.

A second instance was the following: In August, 1911, there were 21 deaths from infantile diarrhea in the city of Richmond during the first 15 days of the month. There were only two days during this period without a death from this cause. There was one death on the 13th, two on the 14th and three on the 15th. There was then a period of 9 days, from August 16 to August 24, inclusive, without a death from infantile diarrhea, and there were only three deaths from this cause during the entire latter half of August, against 21 during the first half. It appeared for a time as if fatal infantile diarrhea was almost over for the year 1911, but in September there was a sudden sharp increase in the prevalence and fatality of the disease, and during that month there were 31 deaths. October followed with 26 deaths, or two more than had occurred in August. This was, and still is, without precedent in the City of Richmond. In this September and October prevalence breast-fed babies had almost as heavy a death rate as bottle-fed babies.

In connection with the above, it was a matter of almost universal comment in 1911 that flies, which had been quite prevalent up to the middle of August, suddenly almost disappeared; but there was a return in September, and during this month and October, flies were unusually prevalent for that season of the year. This corresponded exactly with the decline and subsequent rise in the infantile diarrhea death rate.

It was just about this time, namely, late in the year 1911, that, considering the evidence which had been gradually accumulating, the following conclusions were reached:

1. *Infection from case to case is the most important single factor in fatal infantile diarrhea in the South.*

2. *Infantile diarrhea being an infectious disease and the infecting organism being thrown off in the bowel discharges, we must by every analogy believe that carriers play an important rôle.*

3. *In view of the above, the proper disposal of the bowel discharges of ALL infants, sick and well, is the most important single measure for the control of fatal infantile diarrhea in the South.*

Of the above conclusions, No. 1 was not, of course, anything new; but, so far as I know, no one had previously suggested that carriers played any important part in the spread of infantile diarrhea, and hence no one had previously directed attention to the importance of proper care of the bowel discharges of *all* babies as a measure of value in controlling the prevalence of infantile diarrhea.

Along with the above conclusions came also the realization that sanitarians had up to that time utterly ignored the fact that when a city is sewered, or when it is provided with sanitary privies, these measures do not automatically dispose of the bowel discharges of the entire population. Under normal average birth rate and death rate of infants, four to five per cent of the population of any community consists of infants under two years of age, and the bowel discharges of this part of the population do not enter promptly into our sewers or sanitary privies. The diaper is its immediate destination, and what happens thereafter depends upon individual care.

As soon as the above conclusions were reached, the nursing force of the Richmond Health Department was informed of the conclusions, and it was strongly impressed upon its personnel that henceforth in their instruction of mothers they were to lay the greatest possible emphasis on the proper disposal of the bowel discharges of infants. They were told that this was, in the opinion of the Chief Health Officer, the most important single measure for the control of fatal infantile diarrhea. It must be made plain that

they were also instructed that all former teachings regarding proper diet, preparation of the baby's food, clothing, fresh air, avoiding exposure to heat, etc., were measures the importance of which was in no degree lessened, but that transcending all these in importance was proper disposal of the baby's bowel discharges.

When all this was done, the diarrhea season for 1911 was already over, and it was too late for any effect to be brought about during that year, but, as shown in tables Nos. 1 and 3, the effect of these teachings appeared promptly and markedly during the first summer thereafter. During the five years from 1907 to 1911, inclusive, the average annual death rate from infantile diarrhea had been 135, and the lowest year during this period had been 122. In 1912 the first year when the new teachings were put into effect, the rate promptly dropped to 100, and in the entire period of eight years during which these teaching have been increasingly emphasized every year, with a single exception, has shown a lower death rate from infantile diarrhea than did the previous year, reaching its lowest level in the present year, 1919, with a rate of 36.

It will be noted from table No. 1 that the infantile diarrhea death rate for 1917 was higher than for either of the preceding years.

Table No. 3 shows that through the month of June the number of deaths from infantile diarrhea in Richmond was lower than in any preceding year. I cannot speak from personal knowledge as to why the rate then went up, as I was not connected with the Richmond Health Department after May 1, 1917. I am rather inclined to believe, however, that the emphasis laid upon the proper disposal of the bowel discharges of babies was somewhat lessened.

The chart which is presented shows in graphic form the figures which are given in Table No. 1. As stated on this chart, dairy inspection started in May, 1907, too late to have any appreciable effect on the infant mortality for that summer. In 1908 dairy inspection had progressed to a point where the entire milk supply of the city was safe for infant feeding. In that year the rate fell to 122 per 100,000

TABLE No. 1.
Annual Number of Deaths and Annual Death Rate per 100,000 Inhabitants from Infantile Diarrhea, Richmond, Va., 1907-1919.

| Year | Deaths from Infantile Diarrhea (under 2 years) Number of Deaths | Death Rate per 100,000 Inhabitants |
|---|---|---|
| 1907 | 161 | 142 |
| 1908 | 140 | 122 |
| 1909 | 147 | 126 |
| 1910 | 169 | 132 |
| 1911 | 196 | 151 |
| Annual Average | 163 | 135 |
| 1912 | 132 | 100 |
| 1913 | 112 | 84 |
| 1914 | 97 | 72 |
| 1915 | 101 | 65 |
| 1916 | 102 | 65 |
| Annual Average | 109 | 77 |
| 1917 | 113 | 71 |
| 1918 | 82 | 51 |
| 1919 | 59 | 36 |
| Annual Average 1915-1919 | 91 | 58 |

TABLE No. 2.
Comparison of Annual Death Rate from Infantile Diarrhea in Richmond During the Five-Year Periods 1907-1911; 1912-1916; 1915-1919.

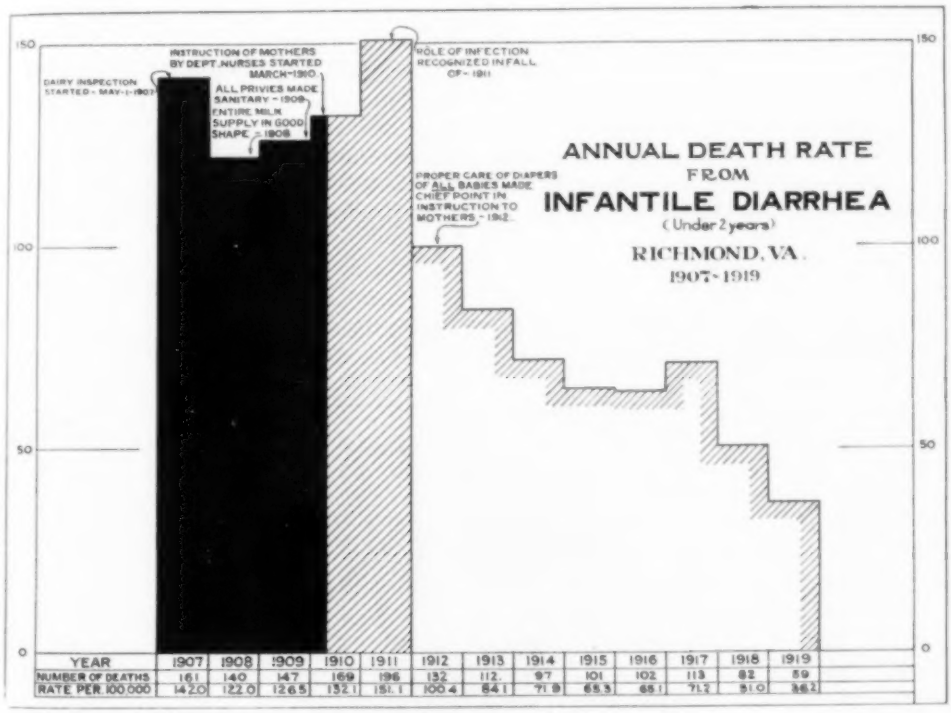
| | Five-Year Period 1907–1911 | Five-Year Period 1912–1916 | Five-Year Period 1915–1919 |
|---|---|---|---|
| Annual Average | 135 | 77 | 58 |
| Highest Year | 151 | 100 | 71 |
| Lowest Year | 122 | 65 | 36 |

TABLE No. 3.
Deaths by Months from Infantile Diarrhea in Richmond, Va., 1907-1919.

| Year | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1907 | 4 | 4 | 5 | 3 | 12 | 39 | 44 | 22 | 15 | 10 | 1 | 2 | 161 |
| 1908 | 0 | 1 | 2 | 1 | 19 | 34 | 33 | 28 | 19 | 8 | 3 | 2 | 140 |
| 1909 | 2 | 1 | 4 | 3 | 17 | 39 | 34 | 16 | 14 | 8 | 2 | 7 | 147 |
| 1910 | 1 | 1 | 2 | 1 | 15 | 49 | 50 | 30 | 18 | 9 | 3 | 0 | 169 |
| 1911 | 1 | 3 | 0 | 1 | 6 | 53 | 45 | 24 | 31 | 26 | 3 | 3 | 196 |
| 1912 | 3 | 0 | 3 | 4 | 2 | 22 | 45 | 17 | 14 | 12 | 7 | 3 | 132 |
| 1913 | 4 | 1 | 1 | 2 | 14 | 31 | 17 | 14 | 16 | 7 | 4 | 1 | 112 |
| 1914 | 1 | 1 | 0 | 1 | 2 | 31 | 25 | 13 | 11 | 8 | 4 | 0 | 97 |
| 1915 | 0 | 1 | 4 | 0 | 6 | 21 | 28 | 17 | 12 | 8 | 3 | 1 | 101 |
| 1916 | 2 | 0 | 1 | 1 | 4 | 17 | 30 | 17 | 13 | 9 | 5 | 3 | 102 |
| 1917 | 3 | 0 | 0 | 5 | 2 | 14 | 35 | 28 | 16 | 6 | 3 | 1 | 113 |
| 1918 | 1 | 2 | 0 | 2 | 4 | 13 | 28 | 16 | 9 | 3 | 2 | 2 | 82 |
| 1919 | 1 | 1 | 1 | 1 | 1 | 10 | 21 | 10 | 7 | 6 | 0 | 0 | 59 |

from 142 in 1907, but in 1909, although improvement of the milk supply had further progressed, the rate went up slightly and was 126.

In 1910 one nurse was employed for instructive work among the mothers of babies who, for one reason or another, were believed to be especially handicapped in their struggle for life. In the following year two additional nurses were employed. In spite of this, the death rate from infantile diarrhea in 1910 was 132, which was higher than for


INSTRUCTION OF MOTHERS BY DEPT. NURSES STARTED MARCH-1910
DAIRY INSPECTION STARTED - MAY-1-1907
ALL PRIVIES MADE SANITARY - 1908
ENTIRE MILK SUPPLY IN GOOD SHAPE - 1908
RÔLE OF INFECTION RECOGNIZED IN FALL OF - 1911
PROPER CARE OF DIAPERS OF ALL BABIES MADE CHIEF POINT IN INSTRUCTION TO MOTHERS - 1912
ANNUAL DEATH RATE FROM INFANTILE DIARRHEA
(Under 2 years)
RICHMOND, VA.
1907-1919
150
100
50
0

| YEAR | 1907 | 1908 | 1909 | 1910 | 1911 | 1912 | 1913 | 1914 | 1915 | 1916 | 1917 | 1918 | 1919 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NUMBER OF DEATHS | 161 | 140 | 147 | 169 | 196 | 132 | 112 | 97 | 101 | 102 | 113 | 82 | 59 |
| RATE PER 100 000 | 142.0 | 122.0 | 126.5 | 132.1 | 151.1 | 100.4 | 84.1 | 71.9 | 68.3 | 68.1 | 71.2 | 51.0 | 36.2 |

either of the two preceding years, while in 1911 the rate was 151, which was the highest for any year of the five-year period.

As soon as an instructive nurse for infant welfare was added to our force, it was made one of her duties to investigate every fatal case of infantile diarrhea, and from that time (1910) to the present date, there has not been a single death from infantile diarrhea in Richmond in

this disease for a period of eight years tributed to any fault of the general milk can have no other interpretation. This factor is, beyond question, recognition and application of the three principles above set down.

Limitation of space prevents thorough discussion here of the details of control of the babies' bowel discharges. Briefly, our nurses instruct mothers along the following lines:

Every baby should be taught at as early an age as possible to indicate, by crying, the fact that it is about to have a bowel discharge, rather than indicate in the same way that this has actually occurred. This is not difficult and is accomplished chiefly by always promptly attending to any indication that the baby has actually had a bowel discharge. A baby, learning thus that it can get relief from the discomfort of a soiled diaper, soon learns to cry a little in advance, and if this crying is understood and promptly attended to, soiling of the diaper can usually be avoided.

Effort is made, after the babies have reached the age of a few months, to have their bowels move over the seat or chamber vessel, at regular intervals, by placing the baby over the seat at such times and encouraging the movement of the bowels by gently touching the parts with a moistened cone of castile soap or a spill of paper moistened in olive oil. It is no uncommon thing for our nurses to have in their care babies five or six months old with whom the soiling of a diaper by bowel discharges is quite the exception.

Where babies have not been trained to this point, the best that can be done is to remove promptly all soiled diapers and dispose of their contents harmlessly.

In conclusion, I wish to reiterate that in my opinion the proper control of the bowel discharge of all babies is the most important single measure for the control of fatal infantile diarrhea in any Southern community. This conclusion was reached late in the year 1911 and put into practical application the following year. Since then there has been a steady decrease in the death rate from infantile diarrhea in Richmond which cannot possibly be attributed to any other cause.

## HOW CONNECTICUT REACHES THE CHILDREN

*"The First Lesson in Sanitation"*

Reproduced through the courtesy of the Connecticut State Department of Health

# BY-PRODUCTS FROM SEWAGE SLUDGE

ROBERT SPURR WESTON,*
*Boston, Mass.*

Read before Sanitary Engineering Section, American Public Health Association, at New Orleans, La., September 27-30, 1919.

**Economy and conservation have worked for years at the problem of profit from sewage. Mr. Weston notes that many American cities have potential by-products enough to make recovery worth trying. English cities have found the American Miles process profitable. It will at least lessen the cost of sewage disposal.**

FOR more than a generation economists have recognized that enormous quantities of fat and fertilizer are contained in and wasted with sewage which is disposed of by dilution, oxidation, or other methods involving the dispersion and destruction of these valuable constituents. The problem of recovery has been attacked time and again, and until recently, without reasonable prospect of success. The failures at Frankfurt-am-Main and Cassel come easily to mind, and the plant at Bradford, England, frequently referred to as a success, does not treat a true domestic sewage, but a trade waste consisting largely of wool scouring liquors from the center of the British woolen-cloth industry.

Notwithstanding its apparent hopelessness of solution, many engineers have believed that the problem would be solved whenever the usual methods of recovery could be adapted to sewage, and money obtained from the sale of the by-products could be applied to reducing the cost of sewage disposal below the cost of existing methods. The best informed engineers do not believe that the recovery and sale of by-products can ever, under normal conditions, make the disposal of sewage a profitable business, but if they can reduce the cost to below that of other methods, which are equally efficient as far as the effluent is concerned, a success will be attained.

Several causes may be given for the renewed interest in fat and fertilizer recovery:

(a) The discovery of the activated sludge process;

(b) The discovery of the Miles process;

(c) The shortage of fats and fertilizers during the great war.

## THE ACTIVATED SLUDGE PROCESS

It is redundant to describe the activated sludge process, beyond stating that it is an oxidation process in which the sewage sludge itself, activated and suspended in the sewage by aeration, is the carrier of the bacteria which effect the nitrification of the organic matter, and the contact medium which brings about the coagulation of the suspended matter and the consequent clarification of the sewage.

## THE MILES PROCESS

The Miles Process, the most recent attempt to reduce the cost of sewage disposal, is another cause of the renewed interest in the subject of this paper.

Beginning about the year 1900, Mr. George W. Miles, a well known Boston chemist, with the co-operation of the officers of the Boston Sewer Department, suggested the use of acid to accelerate the precipitation and separation of sludge, and proposed to recover fats and fertilizer from the sludge so produced. The most important factor in the new process

*Of Weston & Sampson, Boston, Mass.

consists in the application of the acid to the sewage itself, rather than to the sludge precipitated therefrom; and it lays emphasis upon the decomposition of the soluble soaps and the liberation of the fatty acids, which latter do not appear as fats when unacidified sewage is tested by standard methods, and are only partially precipitated with the sludge in plain subsiding basins. Furthermore, Miles has suggested the use of sulphur-dioxide gas rather than the sulphuric acid made from it, thereby avoiding several expensive steps in its manufacture and greatly reducing the cost, besides bringing into play the disinfecting action of the sulphur-dioxide gas upon the sewage itself. If desired, a combination of sulphuric and sulphurous acids may be used.

Sodium acid sulphate (niter cake) is the waste product from the nitric-acid plants, and, as a result of the war, there are enormous quantities of this material piled near nitric acid plants, for which there is now little use. At the present time this is the cheapest source of sulphuric acid. Before the war the cheapest source was either sulphur or pyrite (ferrous sulphide).

Several experiments have been made with this process. The first one was conducted by Mr. E. S. Dorr and other officers of the Sewer Division of the City of Boston, at different times between June 20, 1911, and June 29, 1914. The results of these experiments are presented in a report published by the writer in connection with his own study of the process for the Sanitary Research Laboratory of the Institute of Technology. In the Technology experiments two continuous runs were made, one of seven days in July, and one of three days in November, 1915; and the volume of sewage treated averaged 8,241 gals. daily. The experiments are described elsewhere*, but the results obtained during the city's experiments were almost duplicated, as the following table shows:

TABLE I

COMPARISON OF AVERAGE RESULTS OF TREATING SEWAGE WITH SULPHUROUS ACID, AS SHOWN IN EXPERIMENTS BY E. S. DORR AND M. I. T. SANITARY RESEARCH LABORATORY, 1912-1914 and 1915, RESPECTIVELY

| | Experiments by E. S. Dorr | Experiments by M. I. T. Sanitary Research Laboratory |
|---|---|---|
| Average daily flow of sewage during experiments, gallons | 92,514,647 | 103,498,049 |
| Average amount of dry sludge, pounds per million gals. of sewage | 1,738 | 1,909 |
| Average percentage of grease in dry sludge | 21.7 | 22.66 |
| Average amount of grease precipitated from sewage, pounds per million gals. | 436 | 430.1 |
| Average amount of sulphur dioxide used, in pounds per million gals. | *2,300 | 1,963 |

*Approximate.

During the summer of 1914, Mr. Langdon Pearse, division engineer of the sanitary district of Chicago, made experiments* to learn whether acidification could increase the yield of fat from the Center Avenue sewage. Tests in barrels and in a tank holding about 1,500 gallons were made under his direction. A three-hour period of subsidence was used and the alkaline sewage required about 3,200 lbs. of 100 per cent $H_2SO_4$ per million gallons. Sulphur dioxide was not tried.

Pearse's results showed that acid treatment produced a higher recovery of fat, namely 69 per cent of that in the sewage as compared with 47 per cent obtained by plain subsidence for three hours. The sludge, which amounted to 2,275 lbs. per million gallons, contained, on an average, 93 per cent of moisture and 25 per cent of fats. The results also showed a great reduction in oxygen demand—170 per cent of that obtained by an Emscher tank. They also showed a removal of 71 per cent of the suspended matter.

Much more extensive experiments have been conducted by Professor C.-E. A. Winslow, of the Yale University Medical School, and Dr. F. S. Mohlman, now chemist of the Connecticut State Depart-

*Weston, R. S., 1916. Tests of a New Process of Sewage Purification with Grease Recovery and Apparent Profit. American Journal of Public Health, 6, 334. Reprinted in Boston City Record, March 3, 1917.

*Sanitary District, Chicago, Report on Industrial Wastes, 1914, pp. 191-194.

ment of Health. The results of these experiments have been embodied in a paper read in September, 1918, before the American Society for Municipal Improvements at its meeting in Buffalo and abstracted elsewhere.*

The experiments were conducted at New Haven with sewages from the East street and Boulevard sewers. In these experiments, the sewage was acidified with sulphur-dioxide gas, and a four-hour period of subsidence was provided. The alkalinity of the East street sewage was very low, so that it was necessary, to secure an excess acidity of 50 p.p.m., to add only 700 pounds of gas per million gallons of sewage treated. With the Boulevard sewage, 1,130 pounds of acid per million gallons of sewage were required to secure the same excess acidity (computed in terms of calcium carbonate).

The treatment removed from 61 per cent to 66 per cent of the total suspended, and 90 per cent of the settleable solids. The removal of bacteria was all that could be desired, the two last experiments with the East street and Boulevard sewages respectively, indicating removals of over 99 per cent of the total bacteria, and of the gas-forming organisms.

The use of acid accelerated the precipitation of the suspended solids by about 50 per cent, only 40 per cent being removed from the untreated sewage by plain subsidence as compared with 60 per cent when the Miles process was used. The average data regarding the production of sludge are as follows:

TABLE II
CHARACTER OF MILES ACID SLUDGE AT NEW HAVEN

| | Totals and Averages |
|---|---|
| Length of runs, days | 192 |
| Total Gallons Sewage Treated | 1,654,940 |
| Pounds of Wet Sludge per Million Gals. Sewage | 3,485 |
| Specific Gravity | 1.057 |
| Percent Moisture | 87.8 |
| Pounds Dry Sludge per Million Gals. Sewage | 439 |
| Ether Extract, Percent Dry Sludge | 28.0 |
| Ether Extract, Pounds per Million Gals. | 121. |
| Volatile Matter, Percent Dry Sludge | 59.6 |
| Nitrogen, Percent Dry Sludge | 2.1 |

*Engineering News-Record, 81, 1034-1036. Also 82, 32-36.

Opposed to these very favorable results is the presence in the grease extracted from the sludge of a large proportion of unsaponifiable material (waxes, mineral oils and similar substances). Substances of this kind are practically worthless, and their removal is attended with a great deal of expense. Winslow and Mohlman are advised by experienced users of grease that it would be necessary to distill the crude extracted product in order to produce a salable grease.

Conditions at New Haven are favorable to the Miles process, to Imhoff tanks combined with chlorination, and to fine screening combined with chlorination, respectively. The activated sludge process would not work because of the presence of copper salts in the sewage.

The operation costs of the various disposal plants are estimated in the following tables:

TABLE III
ESTIMATED COST OF TREATMENT OF NEW HAVEN SEWAGE
*Dollars per Million Gallons*

| Process | Miles Acid Process | Imhoff Tanks and Chlorination | Fine Screens and Chlorination |
|---|---|---|---|
| East St. Sewage— | | | |
| Gross Cost | 15.50 | 11.99 | 11.03 |
| Revenue | 6.57 | 0.00 | 0.00 |
| Net Cost | 8.93 | 11.99 | 11.03 |
| Boulevard Sewage— | | | |
| Gross Cost | 20.98 | 12.14 | 12.35 |
| Revenue | 10.66 | 0.00 | 0.00 |
| Net Cost | 10.32 | 12.14 | 12.35 |

The results of these experiments have warranted the New Haven Committee in recommending the Miles process for adoption by the City of New Haven, and that a plant be built first at the East street sewer, which discharges 16,000,000 gals. daily, and, if this plant be successful, the sewage from the other outfalls should be treated.

The Miles process has now reached a stage where a large experiment to determine the cost factors for dewatering, drying, and degreasing sludge, and marketing the products, is desirable. In this the Miles process would have one disadvantage over the activated sludge process, in that the fertilizer produced will not be of quite so high a grade. On the other

hand, the sludge contains not only the precipitated free fats, but a large part of the fatty acid set free from the dissolved soaps by acid treatment. When compared with most other sludges, particularly with the activated sludge, the problem of dewatering and drying is much less serious, as the following table indicates:

TABLE V

| Kind of Sludge | Average Percentage of Moisture in Sludge | Relative Volume of Sludges Containing the Same Amounts of Dry Matter |
|---|---|---|
| Activated Sludge ..... | 98.5 | 100 |
| Subsiding Basin Sludge. | 91.5 | 18 |
| Miles Process Sludge... | 90.0 | 15 |
| Imhoff Tank Sludge.... | 89.0 | 13.6 |

While the economy of the Miles process may not be known for any particular case without a large scale experiment, there have been some experiences in England which are illuminating, notably at Wolverhampton where, during the war, the sludge from plain subsiding basins was treated with acids and fats, and fertilizer recovered with great economy, and at Morley where Mr. F. Turner, the Burrough Engineer,* has put what is essentially the Miles process into practice, although under unusually favorable conditions.

At Morley the chemical precipitation of sewage was first practiced with the result that in six years twelve acres of land had been covered with sludge to an average depth of three feet. The dried sludge contained 16 per cent of grease and farmers would not accept it as a gift. Recently 80 per cent sulphuric acid (brown oil of vitriol, "B.O.V.") was substituted for lime. This effected a 25 per cent reduction in the volume of sludge and increased the grease from 16 per cent to between 30 and 45 per cent of the dried sludge. These percentages are of course unusual, being nearly twice what might be found in typical acid-treated, municipal sewage, but the economies effected therewith are indicative of what might be secured in a lesser degree with the weaker sludge. The treatment is as follows:

Six presses are required to make 3[illegible] pressings per week. The amount of sludge handled daily is 176,000 lbs. and the work requires seven men on eight hour shifts.

During 1918 the works operated at a profit of $683.77 per week.

Comparing these efficiencies and costs at Morley with those corresponding to Boston sewage on a strictly pro-rata basis, we obtain, for 12,500,000 gals. weekly, the following:

*Receipts:*

| | | |
|---|---|---|
| 12 Tons Fertilizer @ $2.43 | $29.16 | |
| 2 Tons Grease @ $195.21 | 390.41 | |
| | | $419.[illegible] |
| Expenses (prorated) | | 551.22 |
| Deficit | | $131.65 |
| Per million gals. | | 10.51 |

This would be a low cost of obtaining a well disinfected, clarified effluent and would probably be lower than the cost of screening or Imhoff-tank treatment, followed by chlorination.

The conditions at Morley were exceptionally favorable. Not only did the sludge contain from 25 to 40 per cent of grease, but the sewage itself was exceptionally strong. On the other hand, the press cake contained but 2.36 per cent of nitrogen, corresponding to 2.80 per cent of ammonia. The amount of dry sludge recovered was about 85 per cent of that which could be obtained from Boston sewage.

The one great problem in the utilization of sewage sludge is its economical drying. For this work a new dryer, known as the B. T. W. dryer, has been tested out at the sewage works at Tadcaster, in York County, England, and the results have been so successful that a large dryer has been ordered for the City of Halifax where the company which controls the dryer commercially has recently concluded a lease with the Halifax Corporation to take all their sewage sludge press cake for a term of fifteen years. In May, 1919, it was hoped that this Halifax plant would be running by now.

It is hoped that this dryer has solved

the problem of drying the sludge from say 75 to say 20 per cent of moisture. To reduce the sludge from the condition which obtains when it comes from the settling tanks, to one containing 75 per cent of moisture, is very difficult. Filter presses and centrifugal machines have been tried, but so far have introduced a great element of cost, even if the process can be called successful in conjunction with the sludge recovery process as a whole. The problem of dewatering the Miles process sludge is much more simple than dewatering the activated sludge, because it is so much drier, as shown by the figures given above.

Recently a chemically cleaned subsiding tank known as the Dorr thickener, originally designed for the concentration of suspensions of ores, known as pulps, has been adapted to sewage disposal work, particularly for the removal of suspended matter from tannery and other similar wastes. It is quite possible that this device might be used to advantage to partially dewater the sludge, particularly if the same be treated first with an additional amount of acid for further coagulation and dehydration.

Because the problem is simply one of stiffening the sludge so that it will not be too fluid for a heated dryer at the beginning of the operation, Mr. E. S. Dorr* has suggested mixing in some dried substance, and for this purpose the best substance would be the previously dried sludge. A few figures show how much of this would be required. For instance, 500 lbs. of 10 per cent (moisture) sludge added to 2,000 lbs. of 85 per cent would give a sludge containing 70 per cent of moisture; or 700 lbs. of 10 per cent added to 2,000 lbs. of 85 per cent, would give 65 per cent sludge. This proposition would involve the addition of simple mixing devices and the use of a larger battery of dryers. On the other hand, but little more fuel would be required as there would be just the same quantity of water to be evaporated whether the sludge were dried in one or two operations. The excess fuel would only be that required by the greater radiation of a larger plant. By this process it would be possible to dry crude sludge by heat alone and thus eliminate the filter presses and centrifugals.

*Sewer Division, City of Boston.

## Summary

The most promising of the sludges from the standpoint of the recovery of by-products therefrom, are those of the activated sludge and the Miles processes. The cost of aeration and acid treatment are not far apart, and the more valuable Miles process sludge contains less water and is much more stable than the bulkier and partially de-fatted activated sludge.

Repeated experiments have shown that many American sewages contain enough fats and fertilizer constituents to make the problem of their recovery worth consideration. This is as far as the art has progressed in this country, but in England, during the war, certain cities using the Miles process, recovered grease and fertilizer at a profit. Furthermore, a dryer has been brought out which promises success with American sewages, and Dorr has suggested a method for avoiding the process of dewatering sludge to a point where it can be handled in a heated dryer. This brings the process to a point where a large scale experiment is necessary. In this experiment, various processes for making sludge and for handling the same should be tried side by side, and devices like the Dorr thickener and the B. T. W. dryer should be valued. This experiment would cost about $50,000 and it is hoped that some municipality or corporation can undertake the work as a means of at least reducing the cost of sewage disposal over that demanded by existing methods, even though the disposal of sewage at a profit be an unrealized dream.

# NEED FOR STANDARDS FOR RECORDING AND CLASSIFYING DEFECTS AND IMPAIRMENTS

JOHN S. BILLINGS, M. D.,
*Formerly Medical Director, Eastern Group of Telephone Companies, Bell System.*
*New York City.*

Read before Section on Industrial Hygiene, American Public Health Association, at New Orleans, October 29, 1919.

**Standardization is one of America's greatest needs, for there are many active agencies that undertake related investigations independent of one another, and overlap and duplicate effort. Out of a very large experience Dr. Billings presents standard forms for records of initial and follow-up physical examinations of industrial employees.**

THE observations and recommendations here submitted are based on an experience of fifteen years with the Department of Health, New York City; the New York Public Library, the New York Stock Exchange, and the Eastern Group of Telephone Companies of the Bell System.

In industrial medicine, particularly that branch concerned with the selection of sound, healthy employees, and with keeping them in good health, some system of medical book-keeping must be devised to determine the value—monetary if you will—of the results obtained. Records of illness incidence and time lost are, of course, of the first importance. But proof is also needed: (1) that the general rank and file are in need of medical advice for the correction of impairments and defects; and (2) that they benefit by such advice.

Medical examination of supposedly healthy individuals is becoming the rule rather than the exception. This applies not only to industrial organizations, but to the general public, the most noteworthy example being the examinations for the Army and Navy during the late war. Much information of value has been obtained, but on the other hand, much of it is useless for comparative purposes, each set of observers adopting its own system of classification. No two sets of results are comparable. The objection may be raised that comparative figures will be of little value because of the varying circumstances; e. g., results of the Army examinations applying only to men of the average age of 20; examinations by such an organization as the Life Extension Institute, to individuals of a much greater average age; and of those in telephone companies to girls between the ages of 17 and 19. Occupation must also be considered. Yet the same objections apply to morbidity and mortality statistics, which are of great value, although the influence of age grouping, sex, occupation and other conditions, must also be considered.

As a rule, the defects and impairments found are recorded under the individual name of each defect. The total number of items given usually averages about 50. In one instance over 200 headings were used.

There is no agreement as to what constitutes a defect or impairment, or if the two terms are synonymous. The question of degree plays little part. A single cavity in an otherwise sound and complete set of teeth has the same weight as a defect, as an advanced case of Riggs' disease. In some instances, temporary ailments (colds, headaches, etc.,) are classed as defects.

At the completion of the first 20,000

examinations made by the Medical Departments of the Eastern Group of Telephone Companies, an attempt was made to compare the results with those obtained by other observers. A considerable amount of material was apparently available, but the comparative figures were very disappointing. No two sets of figures could be used as they stood. An attempt was made to condense the results within the limits of a standard 15-group classification of defects and impairments, in the hope that the various sets of statistics could be reduced to some uniformity. Yet only a few could be adapted for use.

The figures of the Federal Draft Boards giving the 500,000 rejections from the Army in 1918, valuable as they are, were of little service, and represented only rejections. The only statistics which could be compared with those of the Telephone Companies, were the figures of the New York City Health Department, and those given by the Life Extension Institute as a result of examination of 2000 industrial and clerical workers. Even in these, the variations were often so wide as to be ludicrous. The following are examples:

Dental Defects 17% in one group against 58% in another.

Nervous Defects 0.7% in one group against 17.6% in another.

Visional Defects 9% in one group against 52% in another.

Hearing Defects 1.8% in one group against 25% in another.

Renal Defects 0.4% in one group against 42% in another.

The only consistent figures were those for heart and blood vessels, ranging between 4 and 9 per cent, and pulmonary conditions, ranging between 2 and 4 per cent.

In the three Medical Departments of the Eastern Group of Telephone Companies, it was attempted, with apparently fair success: (a) to define and standardize defects and impairments so that they can be readily tabulated; and (b) to devise a standard classification of impairments, with a minimum number of groups, into which all impairments will fall, and which will be of real service to the executives.

### DEFECTS AND IMPAIRMENTS

If all variations from the normal are to be considered as defects, fully 90 per cent of all persons examined will be found to be physically imperfect, and the majority of statistics of physical defects seem chiefly intended to demonstrate this fact. Many examiners thus go too far in their attempt to demonstrate the value of medical examinations of supposedly healthy persons. They should bear in mind that where the same defect exists in the majority of individuals, the presence of that defect is normal and not abnormal. The true object is to determine, not the total number of variations from the normal, but only those in which such variations really impair function. The former may be termed "Defects;" the latter "Impairments."

*Defects* are variations from the physical normal; they may or may not be impairments, either actual, potential or corrected. They should not include acute ailments or accidents, except as to their sequelæ.

*Impairments* are defects which appreciably interfere with the proper performance of duty; either directly, (faulty vision or hearing, loss of time because of illness); indirectly, by lowering the general working powers (chronic dyspepsia, general debility); or potentially, in the future (hernia without a truss, etc.)

*All impairments are defects, but all defects are not impairments.*

Impairments well corrected, whether temporarily or permanently, should be classed as defects for the time being.

For purposes of medical bookkeeping, only uncorrected impairments should be considered, and these should be classified as "correctable" or "non-correctable." The examining physician determines whether a defect is an impairment; if it is correctable, and in the latter case,

## MEDICAL HISTORY AND EXAMINATION

Name ... Occ. ... Dept. ... Bus. Addr. ... Date

Address ... Age ... Sex ... Race ... M. S. W. Children ... Prev. Occ.

Referred By ... Physician Name ... Address ... Phone No.

Reason for Visit { Voluntary / Supervisor / Medical Dept. } ... Dept. and Comp.

**Past History**

Family History ... Hosp. or San History ... Obstetrical

Year of Disease: Typhoid Fever, Measles, Pneumonia, Tuberculosis ... Pleurisy, Colds ... Scarlet Fever, Diphtheria, Goitre ... Mens. Irregularities, Epilepsy, etc., Goitre

Accidents ... Operations ... Vaccinations: Typhoid, Smallpox

**Present History**

Habits: Air, Tub, Tea, Cof, Sleep, Character, Hrs., Exercise

Appetite ... Digestion ... Constipation ... Headaches ... Menses

Symptoms (Duration, Cause)

Chief Complaint

Absent from Duty—Yes, No. Since

**MEDICAL EXAMINATION**

Development and Appearance { ... M. M. ... Voice ... T ... R ... P ... Quality ... Rhythm ... Height ... ft. ... in.

Arteries ... Blood Pressure: Sys. / Diast. ... Reflexes ... Weight: Usual ... Present

Ears ... R. ... L. ... Eyes ... R. ... L. With / Without Glasses ... Pupillary Reactions ... Light / Distance

Tongue ... Teeth ... Tonsils ... Pharynx ... Nasal Passages

Throat ... Flatfoot: R. ... L. ... Skin: [Cold, Warm], [Dry, Moist] ... Eruption

Heart

Lungs

Abdomen ... Glands ... Circumcision / Hydro. / Varicocele

Deformities ... Hernia

**Laboratory**

A Date ... Sp. Gr. ... Alb. ... Sugar ... Micro ... Date ... Sp. Gr. ... Alb. ... Sugar ... Micro

B Date ... Sp. Gr. ... Alb. ... Sugar ... Micro ... Date ... Sp. Gr. ... Alb. ... Sugar ... Micro

Blood, Sputum, etc.

Correctable Impairments ... Treatment Recommended / Yes / No

Non-Correctable Impairments

Remarks

Examined by ... M. D.

## REVERSE OF ABOVE CARD

Present Health and Gen. Cond. Since Last Exam ... Date

Habits ... Sleep ... Exercise ... Appetite ... Digestion

Constipation ... Menses ... Pulse ... Weight ... Reflexes

Blood Pr. S. ... D. ... Hearing: R. ... L. ... Vision: R. ... L. ... Pup. Reactions ... Tongue

Teeth ... Tonsils ... Pharynx ... Nasal Pas. ... Glands

Lungs ... Heart ... Abdomen

Urinalysis: Sp. Gr. ... Alb. ... Sug. ... Microsc. ... Other

New Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Present State of Previous Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Remarks ... By ... M. D.

Present Health and Gen. Cond. Since Last Exam ... Date

Habits ... Sleep ... Exercise ... Appetite ... Digestion

Constipation ... Menses ... Pulse ... Weight ... Reflexes

Blood Pr. S. ... D. ... Hearing: R. ... L. ... Vision: R. ... L. ... Pup. Reactions ... Tongue

Teeth ... Tonsils ... Pharynx ... Nasal Pas. ... Glands

Lungs ... Heart ... Abdomen

Urinalysis: Sp. Gr. ... Alb. ... Sug. ... Microsc. ... Other

New Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Present State of Previous Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Remarks ... By ... M. D.

Present Health and Gen. Cond. Since Last Exam ... Date

Habits ... Sleep ... Exercise ... Appetite ... Digestion

Constipation ... Menses ... Pulse ... Weight ... Reflexes

Blood Pr. S. ... D. ... Hearing: R. ... L. ... Vision: R. ... L. ... Pup. Reactions ... Tongue

Teeth ... Tonsils ... Pharynx ... Nasal Pas. ... Glands

Lungs ... Heart ... Abdomen

Urinalysis: Sp. Gr. ... Alb. ... Sug. ... Microsc. ... Other

New Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Present State of Previous Imp. ... Non-Correctable ... Correctable ... Treatment Recommended / Yes / No

Remarks ... By ... M. D.

gives the necessary instructions and advice. It is possible, therefore, to tabulate the number and kind of correctable impairments found in a number of individuals by the different members of the medical staff. The results of examination a year later, can be tabulated in the same way, and a comparison of the figures will show a greater or less diminution year by year in the number of correctable impairments found.

Exaggeration of the importance of defects must, of course, be avoided. An excellent rule is to consider whether a given defect in one's own person would impair efficiency. Very few persons have perfect vision or hearing, yet such defects are frequently not impairments.

### STANDARD CLASSIFICATION OF IMPAIRMENTS

The following standard classification of impairments, correctable and non-correctable, has been in use about one year. Thus far, it has given satisfaction, and all defects found fall readily within one or the other of the fifteen groups, which are as follows:

1. Teeth
2. Pharynx, tonsils, nose, etc.
3. Nervous disorders
4. Vision
5. Development
6. Malformation
7. Digestive disturbances
8. Heart and blood vessels
9. Lung conditions and tuberculosis
10. Menses
11. Hearing
12. Hernia and varicosities
13. Skin affections
14. Kidneys
15. Miscellaneous

### PROCEDURE

The results of examination are recorded on a standard Medical History and Examination Card, all defects being entered on the body of the card. Severity is indicated by one or more + marks. + signifies negligible; ++, of moderate severity, calling for eventual correction; and +++, urgent, calling for immediate correction.

At the lower margin of the record of

TABULATION OF IMPAIRMENTS.

Correctable – ✓
Non-Correctable – O

| DATE | NAME | DEPT. | Teeth | Pharynx, Tonsils, Nose, etc. | Nervous Disease | Vision | Development | Malformation | Digestive Disturbances | Heart & Blood Vessels | Lung Condition | Menses | Hearing | Hernia, Varicosities, etc. | Skin Affections | Miscellaneous | Other Impairments | REMARKS | Examiner's Initials |
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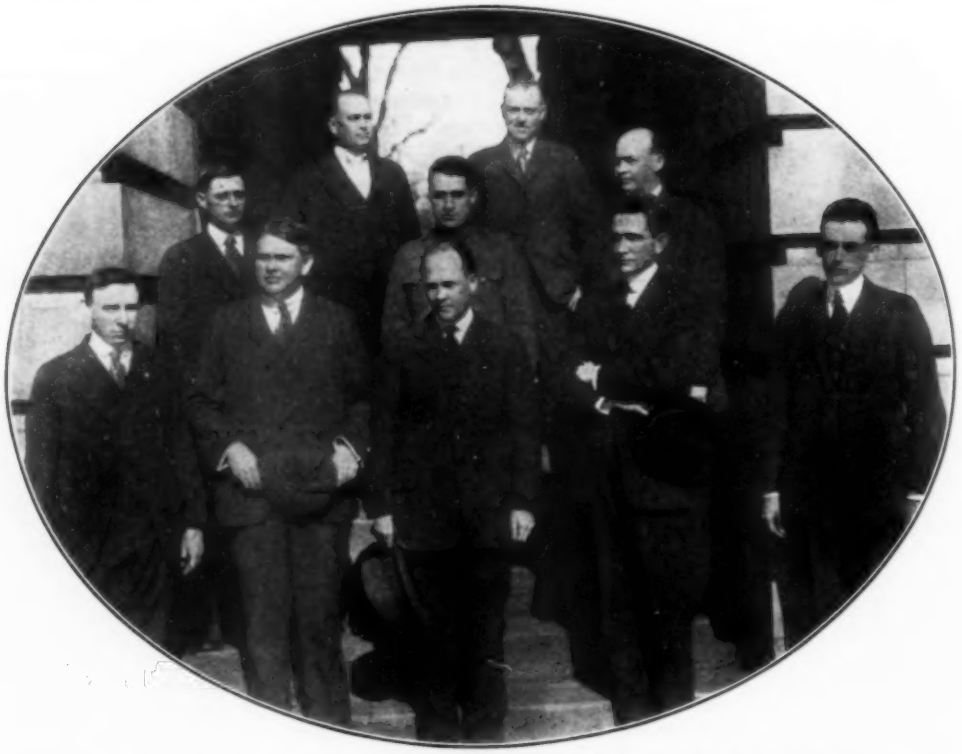
the first examination, are spaces for true impairments, correctable and non-correctable. The record of later examinations shows the same items, with spaces for present state of previous impairments.

The impairments are brought together on a standard tabulation sheet which shows, horizontally, the results of the successive examinations of the same individual, and what has been done in the way of correction. Vertically, the totals give the impairment figures for groups of individuals, as many as desired. As before stated, the work of the individual physicians can be controlled.

## CONCLUSION

An attempt has been made to show the need for standard definitions of defects and impairments, and a standard method of classifying and tabulating the same. Certain simple, somewhat arbitrary methods which have given satisfaction, have been described. The matter would seem to be of sufficient importance to warrant a recommendation that a committee of the A. P. H. A. be appointed to take up the matter in joint conference with a similar committee of the Association of Industrial Physicians, and to submit recommendations as to the best methods of securing uniform results.

## CONFERENCE OF NORTH CAROLINA HEALTH OFFICERS, JANUARY, 1920



Not long since an illustration was given showing the New York health officers attending the Health Officers' Class at Syracuse University. Here is a group of men in similar work in another part of the country, being the County Health Officers of North Carolina, who have been called together at Raleigh by State Health Officer W. S. Rankin, M. D., for a conference, with all that such an occasion means in the exchange of experiences.

# MEAT INSPECTION LAW FOR MUNICIPALITIES

W. PARKER JONES, ATTORNEY-AT-LAW,

*Formerly Assistant Solicitor, U. S. Department of Agriculture, Washington, D. C.*

Read before Section on Food and Drugs, American Public Health Association, at New Orleans, La., October 29, 1919.

**Less than one-third of our cities of 5,000 population or more have any regulation of meat inspection, and in many of these the inspection is incomplete. This affects communities using local meats, which are more likely to be infected than are interstate meats. Public health demands serious reforms in this matter.**

TWENTY years' experience of our National Government has demonstrated conclusively that an adequate system of inspection is necessary to make the meat supply safe for human consumption, and that it is entirely practicable to inaugurate and maintain a complete and thorough inspection at a relatively small expense. To the lasting credit of our country, it is generally conceded that the Federal Meat Inspection, under the Act of 1906, supplemented by the Act of October 3, 1913, as they are administered by the Federal Bureau of Animal Industry, have been potent factors in making American meat and meat products the best in the world.

While the quality and the wholesomeness of the meats we send to foreign countries and ship across state lines for domestic consumption is of the best, it is unfortunate that the same may not be said of the meat and meat products derived from animals which are slaughtered and disposed of within the borders of any one state. This is because the scope of the Federal Meat Inspection Law is limited to meats and meat food products which are transported in interstate or foreign commerce, and does not extend to meats and products prepared and sold entirely within the borders of a state.

For a number of years the number of cattle, sheep, swine and goats slaughtered under Federal Inspection has approximated 60,000,000 head. About half this number, or approximately 30,000,000 head, of all the animals slaughtered in the United States, do not move in interstate or foreign commerce and, therefore, do not have the benefit of Federal Inspection. Perhaps the most effective illustration of the service which has been performed by the Federal Meat Inspection system is that although the recent war made unprecedented demands for the movement of a steady supply of meat products to maintain both American and foreign armies at home and in the field, and none but U. S. inspected and passed meat and meat products were purchased by this Government, there has been no serious question raised as to their quality or wholesomeness. Through co-operation, the American meat packers and the Federal Inspection service were able to keep a steady supply of wholesome meats flowing to the points where they were most needed. The supply for our civilian population was ample to meet its demand, which was abnormally high. This was a most remarkable achievement, and one which undoubtedly contributed greatly to the success attained by the American and Allied armies.

Notwithstanding the shining example of Federal Meat Inspection, a recent survey shows that less than one-third of the cities of the United States having a population of 5,000 or more, maintain any

kind of Meat Inspection, and even in those having inspection it is frequently incomplete. The absence of a thorough system of inspection for meats slaughtered and disposed of locally is a distinct menace to the health of the citizens of the respective communities. In localities where there is Federal Inspection, owners of diseased or suspicious-looking animals often send them for slaughter to an abattoir which does not have inspection, in preference to an inspected establishment where they would have to meet the tests of rigid inspection. The establishments which have Federal Inspection draw a large proportion of their cattle from the ranges and feed lots of the west, where tuberculosis is rare. Hence, the percentage of diseases found in the Federal service is far below that which occurs in animals of the dairy regions where tuberculosis is much more prevalent. It is estimated that not less than 10 per cent of the dairy cows in this country are affected with tuberculosis, and it is a well-known fact that dairy stock forms a much larger proportion of the animals killed at the small local establishments than they do at Federally-inspected establishments. Further, the local establishments which do not have inspection frequently pay relatively low prices for food animals, and since they are not required to maintain their establishments, or to operate them in accord with the strict sanitary requirements of Federal Inspection, are free from many items of expense. This enables the uninspected local houses to sell their products at a comparatively low price, resulting in the consumption of their products, to a considerable extent, by persons of small means. This not only produces unfair competition and deprives many of our people who most need it of protection from diseases of animals communicable to man, but removes a powerful incentive from the owners of diseased live stock to improve the condition of their herds. If there were no market for diseased cattle, sheep, swine and goats, the work of Federal and State officials in endeavoring to improve the quality and condition of our food animals would be easier. In considering what provisions must be incorporated in a municipal meat inspection law, it is not necessary to look beyond the standards of the Federal Meat Inspection Law, because they are not excelled in any foreign country.

The Meat Inspection Law of June 30, 1906, is primarily a health and secondarily a labeling law. Inspection of meats derived from cattle, sheep, swine and goats, prior to entry into interstate or foreign commerce, is mendatory, except in the cases of retail butchers and retail dealers supplying their customers and of animals slaughtered by farmers on the farm.

It provides for the maintenance by the Department of Agriculture of a system of inspection of establishments in the United States in which cattle, sheep, swine or goats are slaughtered or the carcasses or meat or meat food products of which are prepared for interstate or foreign commerce. When the articles are found to be wholesome, the department inspectors must mark them "inspected and passed"; if the articles are found to be unwholesome, they must be marked "inspected and condemned." No meat or meat food products are permitted to be brought into federally inspected establishments unless derived from animals which have had both ante-mortem inspection and post-mortem inspection at the time of slaughter, except farm-slaughtered animals, with the heads and certain viscera attached, which must be inspected at the time of admission. By a recent regulation, the carcasses of cattle which are slaughtered on the farm, and which are examined by Bureau inspectors at the time of slaughter, may be marked "inspected and passed" by the inspectors, when upon inspection they are found to be sound, healthful and wholesome and fit for human food. Inspection may be withdrawn from establishments which violate the law or the regulations pre-

scribed by the Department. The withdrawal of Federal inspection from an establishment amounts to prohibition against its longer engaging in interstate or foreign commerce in articles with which the Act deals.

Transportation in interstate or foreign commerce of any meat or meat food product not bearing the mark of Federal inspection and approval is an offense, punishable by a fine of not more than $10,000 or imprisonment for not more than two years, or both. The sale or offer for sale or transportation for intertsate or foreign commerce of any diseased, unsound, unhealthful, or unwholesome meat or meat food product, or of such an article which is otherwise unfit for food, with knowledge that the same is intended for human consumption, is punishable by a fine of not exceeding $1,000 or by imprisonment for not exceeding one year, or both.

In addition, all meats and meat food products entering interstate or foreign commerce, or manufactured or sold in the District of Columbia or in the territories, are subject to the provisions of the Food and Drugs Act. While the meat inspection act does not provide authority to seize such articles outside of federally inspected establishments, the power of seizure conferred by the Food and Drugs Act is applicable to them.

The Meat Inspection Act exempts from its inspection requirements any animals slaughtered by farmers on the farm and retail butchers and retail dealers in meats and meat food products supplying their customers, but provides that if any of these persons ships his products in interstate or foreign commerce, knowing that it is intended for human consumption, and it be unfit for food, he is guilty of a violation of the law.

As originally enacted in 1906, the meat inspection act did not deal with imported meats. They were subject only to the Food and Drugs Act. By the tariff act of October 3, 1913, the importation of meats was made conditional upon their being wholesome and free from unwholesome substances and complying with regulations of the Secretary of Agriculture. To ascertain wholesomeness, the Secretary of Agriculture investigates foreign systems of meat inspection and requires import consignments to be accompanied by ante-mortem, post-mortem and sanitary inspection certificates, issued by accredited officials of the National Governments of the countries of origin. Importations are prohibited from countries which do not maintain systems of inspection the substantial equivalent of our own, and articles found upon inspection at ports of entry to be unwholesome or to contain unwholesome substances must be refused admission into the United States. After admission, with marks of Federal inspection and approval, such imported products may be carried into federally inspected establishments and must be otherwise treated as domestic articles which have been inspected and passed.

The Federal Meat Inspection Law contains three fundamental requirements. The first requirement, and one which is indispensable in any adequate system of meat inspection, is that meat and meat products to receive the stamp of inspection and approval must be derived from the carcasses of animals which receive post-mortem inspection at the time of slaughter. The second requirement is that the meat and meat products must be derived from animals which receive ante-mortem inspection prior to their being admitted into slaughtering establishments. The third requirement is that the animals must be slaughtered and the products handled in sanitary establishments and in a sanitary manner.

No system of meat inspection is complete without ante-mortem inspection, or without adequate requirements for sanitation, but these are not so important as the post-mortem inspection.

Ante-mortem inspection is less important because the diseases of animals communicable to man which may be detected

on ante-mortem inspection but which may not be detected on post-mortem inspection are generally comparatively few. Sanitary conditions of establishments are of less consequence than post-mortem inspection because it does not follow necessarily that because an establishment does not comply with modern ideas concerning sanitation, the quality or wholesomeness of the meat and meat products prepared therein will be injuriously affected.

Nevertheless, we find on examination of the municipal ordinances relating to meat inspection that the great majority stop as imposing requirements concerning the sanitary conditions of slaughter houses, and that few provide for compulsory post-mortem inspection of carcasses of animals. The omission from municipal meat inspection ordinances is especially noted of provisions by which it is made certain that meats and meat products from animals which are condemned for disease will be destroyed. Under these ordinances there is no assurance that the meats will be actually withheld from distribution. Further, in very few of the municipal laws is there any provision made for efficient administration by men who are trained and are competent in the work of meat inspection. The great success of the Federal Meat Inspection Laws is largely due to the competency and the industry of the trained officials engaged in administering them.

In some cities local meat inspection consists merely in a reinspection of meats which have been inspected by the Federal Government and approved and marked. The possibility of deterioration of inspected and passed meats, in view of the rapidity with which they go into distribution after they have received the Federal mark, is slight, and a system of municipal inspection which covers merely the reinspection of meats and meat food products which already bear the Federal stamp accomplishes little. Much more is to be accomplished by a system which directs its activities toward the inspection and disposition of the products of animals which are killed and distributed locally.

There are a few of our American cities which have adequate municipal meat inspection and which also provide adequate forces for administering the laws. The City of San Francisco has provided for the inspection of meat and meat food products offered for sale within the city and county of San Francisco in Ordinance No. 1265, approved August 1, 1910. This ordinance reads as follows:

Be it ordained by the people of the city and county of San Francisco as follows:

Section 1. No person, firm or corporation shall expose or offer for sale, or sell or otherwise dispose of, or have in his possession within the city and county of San Francisco, any meat of any cattle, calf, sheep, lamb, goat or swine which does not have upon it the meat inspection brand or other official mark of identification of the Board of Health of the city and county of San Francisco, or the meat inspection brand or other official mark of identification of Boards of Health of the state of California whose meat inspection standard is equal to and recognized by the San Francisco Board of Health, or the meat inspection brand or other mark of identification of the United States Department of Agriculture. If any carcass of any animal hereinbefore named, or part thereof, is found, offered for sale or exposed within the city and county of San Francisco, which does not bear any of the meat inspection brands or marks recognized by the Board of Health of the city and county of San Francisco, said Board of Health shall take possession of and destroy such meat.

Sec. 2. No person, firm or corporation shall ship, send, bring or cause to be brought into the city and county of San Francisco the meat of any cattle, sheep, lamb, goat or swine which does not bear the meat inspection brand or other mark of identification recognized by the Board of Health of the city and county of San Francisco.

Sec. 3. The carcasses of calves in good healthy condition and over four weeks of age may be brought into the city and county of San Francisco, and each of said carcasses of such calves must be inspected and stamped or marked by the San Francisco Board of Health at the point of arrival of said carcasses of such calves in the city and county of San Francisco.

Sec. 4. An ante-mortem examination shall be made under the direction of the Board of Health of the city and county of San Francisco of all cattle, sheep, swine or goats about to be slaughtered before they shall be allowed to enter the slaughtering pen. All animals showing symptoms of or suspected of being affected with any disease or condition which under the regulations of the Board

of Health of the city and county of San Francisco would probably cause their condemnation in whole or in part when slaughtered, shall be marked by affixing to the animal a metal tag bearing the words, "San Francisco Board of Health Suspect." All such animals shall be slaughtered separately.

Sec. 5. A careful post-mortem inspection under the direction of the Board of Health of the city and county of San Francisco must be made of all animals herein named at the time when slaughtered in the city and county of San Francisco. The head, tongue, tail, thymus gland and all viscera of each animal shall be retained in such a manner as to preserve their identity, until after the post-mortem examination has been completed, in order that the parts so retained may be identified in cases of condemned carcasses. Suitable racks or metal receptacles shall be provided in and by each slaughtering establishment for retaining said parts.

Sec. 6. All carcasses, meats or meat food products which are unsound, unhealthful, unwholesome or otherwise unfit for food, shall be stamped or otherwise marked by the Board of Health of the city and county of San Francisco, "San Francisco Board of Health, Inspected and Condemned," and shall be destroyed.

Sec. 7. All meats or meat food products offered for sale in the city and county of San Francisco shall be subject to reinspection and condemnation at any and all times by the Board of Health of the city and county of San Francisco.

Sec. 8. The Board of Health of the city and county of San Francisco is hereby authorized and directed to adopt rules and regulations governing the sanitation of slaughter houses and establishments where meat food products are sold or manufactured, the inspection of meats and the ultimate disposal of condemned meats, in addition to the provisions of this ordinance, as will enable the said Board of Health to enforce and carry out the meaning and intent of this ordinance. The standard of meat inspection shall be that adopted by the United States Department of Agriculture.

Sec. 9. It shall be unlawful and a violation of this ordinance for any person, firm or corporation, or officer or agent, or employe thereof, to forge, counterfeit, simulate or falsely represent, or without authority to use or detach, or knowingly or wrongfully alter, deface or destroy any of the stamps or marks or brands or tags recognized by the Board of Health of the city and county of San Francisco, on any cattle, calf, sheep, lamb, goat or swine, or any carcass, or on any part or parts of any carcass or carcasses of any animal named in Sections 1, 2 and 3 of this ordinance.

Sec. 10. Any person, firm or corporation, or other agents, violating any of the provisions of this ordinance or failing to comply with any direction or order of the Board of Health of the city and county of San Francisco, given pursuant to the provisions of this ordinance by the health officer or any other agent of said Board of Health, shall be guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not less than fifty ($50) dollars, nor more than five hundred ($500) dollars, or by imprisonment in the county jail for a period of not less than ten (10) days nor more than three (3) months, or by both such fine and imprisonment.

Sec. 11. Each day that the violation of this ordinance or the failure to comply with the directions of the Board of Health of the city and county of San Francisco, given in accordance with this ordinance, shall continue, shall constitute a new and separate offense, and be punishable accordingly, as herein provided.

Sec. 12. All ordinances and parts of ordinances in conflict with this ordinance are hereby repealed.

Sec. 13. This ordinance shall take effect immediately.

This ordinance is modeled after the Federal Meat Inspection Law and adopts the standards of the Federal Meat Inspection Law, so far as they are applicable. It provides that no meat shall be allowed to be sold in the City or County of San Francisco unless it bears an identification mark of a board of health whose meat inspection standard is equal to a standard adopted by the ordinance. The ordinance makes both post-mortem and ante-mortem inspection compulsory, and it confers the power upon the city board of health to make necessary regulations for giving effect to its provisions. The regulations which have been adopted by the San Francisco board of health conform to those which have been adopted by the United States Department of Agriculture. The power conferred to make regulations leaves sufficient latitude to provide requirements which will meet the progress of science and new developments in the meat industry.

San Francisco is not the only city which has effective municipal meat inspection. In New York City, in Philadelphia and in Boston, local meat inspection is quite thorough and efficient. Among the smaller cities a notable example of accomplishment in meat inspection is Columbus, Ga. The record of our American cities as a whole, however, in this

respect, cannot be commended and there is room to perform a valuable public service by arousing public sentiment to secure the enactment generally of municipal ordinances similar to the San Francisco ordinance.

The enactment of appropriate ordinances alone will not suffice. To bring about substantial improvement, adequate funds must be provided for administration, the service must be divorced from politics, and trained men must be employed who can devote their entire time to the work of meat inspection. The compensation of employes should not be made to depend upon fees, nor should they be permitted to collect fees. The expense should be borne by the community as a whole, and if a town or city is unable to bear it alone, the expense might be defrayed by two or more jointly or by a county.

The adoption of ordinances containing the requirements of the Federal Meat Inspection Law, so far as applicable, with proper provisions for enforcement, is urged as an immediate and pressing public necessity, to make safe for human consumption the meat and meat food products of the 30,000,000 or more head of cattle, sheep, swine and goats against which our municipalities, with comparatively few exceptions, now afford no satisfactory protection.

□

**Trachoma Survey in Cincinnati.**—The United States Public Health Service, under the auspices of the State Department of Health, co-operating with the Cincinnati Board of Health, has undertaken a survey to learn if there is any trachoma in the city.

Trachoma is not a new disease. Our knowledge of it extends back for centuries. Some publicity has been given to the disease recently, but we have not stressed enough its prevalence, its effect upon vision, its communicability—and in this respect, trachoma is a menace to America—and the relatively simple method of prevention.

Trachoma is a slow but sure communicable disease, characterized in the beginning by granulated eyelids. The slow and insidious development of the disease robs it of the terror that usually accompanies the acute infectious diseases. Indeed, some of the victims do not complain, probably because they do not know how a good eye feels. In general, however, the patient is uncomfortable by day or night on account of the itching and burning and sensitiveness to light. Untreated, it continues on like a smouldering ruin until it burns itself out, but the damage done is irreparable.

We do not know exactly how trachoma became implanted in the United States, but it is most probable that the disease was brought in from European countries.

In the State of Kentucky, after the United States Public Health Survey, it was estimated that there were 33,000 cases of trachoma. It is also prevalent to a large extent in Virginia, Tennessee and West Virginia.

The General Assembly appropriated $20,000 for a two year campaign in the State of Ohio. Cincinnati is the first large city to benefit by the survey, which will be conducted under the personal direction of Surgeon John McMullen, United States Public Health Service, who has devoted the last twenty-two years directing the anti-trachoma work of the Government. Dr. Frank Boudreau, Director of Communicable Diseases; Dr. Robert Lockhart, Director of Trachoma Clinics; Dr. Ralph Tate and Dr. Ross Hopkins of the State Department of Health; Dr. Louis Stricker, consulting oculist to Cincinnati schools, and Dr. Oscar M. Craven, Chief Medical Inspector of Cincinnati, will assist Dr. McMullen.

## Note Revised Date for San Francisco Meeting, A. P. H. A. September 13-17, 1920

# FEDERAL MEAT INSPECTION AS A SAFEGUARD TO PUBLIC HEALTH

JOHN R. MOHLER, V. M. D.,

*Chief, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.*

Read before Food and Drugs Section, American Public Health Association, at New Orleans, La., October 30, 1919.

**There is no Federal inspection for one-third of the meat consumed in this country. Further than this, there is much needed in constructive work on the part of states and municipalities, in which this one-third is produced and slaughtered. Cities plead lack of funds, and there is also lack of knowledge and lack of interest. Meat is too important a feature in our lives to be thus neglected.**

IT is common knowledge that the Federal Government maintains through the Bureau of Animal Industry of the United States Department of Agriculture a system of meat inspection, but comparatively few persons are familiar with its scope or the manner in which it protects public health. The work is scientific and technical and gives consumers comfortable assurance that the inspected products they buy are healthful and wholesome. The inspection proceeds by logical steps, beginning with the careful ante-mortem examination of the animal, continuing with the inspection of the carcass while being dressed, the supervision of the curing, pickling, smoking, cooking, or canning, of all meats, and finally with the proper, honest labeling of all meat or meat products.

## MORE THAN SEVENTY MILLION ANIMALS INSPECTED LAST YEAR

The extent of the Federal Meat Inspection Service is definitely shown by the number of cattle, sheep, goats and swine slaughtered under federal inspection. For a number of years the totals have approached 60,000,000 annually, or nearly two-thirds of all such animals slaughtered for food in the United States in the same periods. Figures for the fiscal year ending June 30, 1919, show a remarkable increase over previous years. Altogether more than 70,000,000 animals were slaughtered under Federal inspection. This inspection included in round numbers: cattle 11,241,000; calves 3,674,000; sheep 11,268,000; goats 125,000, and swine 44,398,000. The statement that so many animals were inspected means that all were examined while alive and that the organs and different parts of each animal were inspected at the time of slaughter to determine their fitness for food. However, this double inspection, complete and important as it is, is but the first of several steps in the federal system. The subsequent handling, processing, preparation, storage and labeling, are given supervision, and the meats are reinspected as often as may be necessary. The federal system has been aptly described as extending "from the hoof to the can," or "from the live-stock pen to the finished meat or product in the labeled package ready for shipment to the consumer."

## WIDE RANGE IN INSPECTORS' DUTIES

The scope and purpose of federal meat inspection are to place the federal mark of approval upon all meats and products which competent examination shows to be sound, healthful and fit for food, and to condemn and destroy those which are

found to be dangerous, unsound or otherwise unfit for such use. The inspection also includes supervision of the establishments with respect to sanitation, construction, and suitable methods of handling all meat and their products. Furthermore, the consumer of meats is protected against the use of harmful dyes and chemicals, and against false or misleading names or statements on labels. In short, the meat inspection service seeks to protect the public health and the rights of consumers, and to do this without infringing upon the just rights of the producer, and without waste of the nation's meat food supply.

Federal meat inspection is being maintained at 825 establishments in 230 cities. These figures undergo some increase or decrease from time to time, but they represent a reasonably permanent average. Stated in round numbers, about 2,600 inspectors are regularly employed. Of this number about 800 are graduate veterinarians; the remainder are lay inspectors who, through experience and training, acquire the technical knowledge and skill necessary to a proper performance of their duties. The appointing of inspectors is controlled by and is in accordance with the requirements of the United States Civil Service Commission.

Sometimes the question is asked why federal meat inspection is not made to cover every slaughter house and meat-preparing plant in the United States instead of a limited number. The answer is that the Federal Meat Inspection Act is based on the commerce clause of the constitution, which restricts the application of federal inspection to establishments engaged in interstate or foreign trade and to meats and products which are to be sold or shipped as articles of interstate or foreign commerce. The inspection cannot be extended to those establishments which confine their sales and shipments to the state in which located. However, when federal inspection is inaugurated at an establishment it is maintained there in respect to the whole establishment and applies to all animals slaughtered, and to all products prepared therein. This is necessary to the completeness of the inspection and to a proper enforcement of the regulations. The result is that very great amounts of meats not shipped or sold in either interstate or foreign commerce, but consumed locally, are, nevertheless, inspected and bear the marks of federal inspection.

The inspection has been extended as far as contemplated and permitted by the law and as far as has been possible with the funds provided by Congress for its maintenance. If the entire meat food supply of the country is to be properly inspected, it will devolve upon the several states or municipalities to establish and maintain an adequate inspection to cover the field to which federal inspection cannot be extended. Many of our cities do maintain such an inspection.

The great need of an efficient meat inspection is shown by the number of animals and the quantities of meats and products which are condemned yearly on account of disease, unsoundness, or other conditions of unfitness, and thereby excluded from the food supply. The complete figures for all classes of animals and the various reasons for condemnation involve considerable detail. However, a general statement regarding them should serve the present purpose. For instance, on the post-mortem inspection alone there was condemned in the fiscal year 1919 a total of 212,245 cattle, sheep, swine and goats; while organs and parts of carcasses condemned on account of localized disease run into the hundreds of thousands.

### TUBERCULOSIS AND HOG CHOLERA CAUSE MOST CONDEMNATIONS

Tuberculosis in cattle and tuberculosis and cholera in swine were responsible for more condemnations than all other diseases and causes combined. In addition to the condemnations on the post-mortem inspection it was necessary to condemn in that year a total of more than 17,000,000 pounds of meats and

products on account of their having become tainted, rancid, unclean, or otherwise unwholesome in the course of shipment, processing, preparation, or storage. The condemnations aggregate an enormous amount of material; fortunately, however, it represents but a relatively small part of the total of animals and meats inspected. By some the condemnations might be regarded as evidence that disease prevails to an unusual degree in American live stock, or that on account of undue strictness the inspection is wasteful of potentially good food. Neither of these deductions is in accord with the facts. Disease is less prevalent in the live stock of the United States than in the various European countries. As regards the inspection it must be maintained in the interest of the public health with a due measure of strictness. Necessarily this entails loss, but such loss cannot be called waste. Moreover, the basic rules and regulations by which condemnations on the post-mortem inspection are determined were prepared with great care by competent officials and then were submitted to an independent committee, composed of scientists and hygienists of the highest reputation, for consideration, and received that committee's approval.

### INSPECTION BEFORE SLAUGHTER

The first examination is the ante-mortem inspection, or inspection of the animals prior to slaughter. They are scrutinized while at rest in the pens or as they are moved from the scales. If the condition of an animal is such as to cause the inspector to suspect that it is diseased or affected by any condition which will cause its condemnation in whole or in part on the post-mortem inspection, the animal is set apart and marked "U. S. Suspect" by means of a serially numbered metal tag affixed to the ear. Such animals are held for separate slaughter and for an especially careful post-mortem examination. The diseases and conditions for which animals are most frequently so tagged are cholera, actinomycosis, emaciation, advanced pregnancy, and severe or excessive injuries. Animals which show symptoms of rabies, tetanus, milk fever, railroad sickness, and hogs which manifestly are sick with cholera are condemned and their carcasses destroyed without admission to the slaughter room. Such animals are marked by the inspector with a numbered metal tag bearing the legend "U. S. Condemned."

### POST-MORTEM INSPECTION INCLUDES EXAMINATION OF ORGANS

The post-mortem or slaughter inspection is the most important of the several inspection procedures because it affords greater opportunity to discover the existence of most diseases. This calls for careful examination throughout. Accordingly, the inspectors first examine those glands, organs or parts in which disease most frequently occurs. For instance, in both hogs and cattle certain of the lymph glands of the neck usually are the first to show evidence of tuberculosis; therefore, these glands in every animal are cut and carefully viewed. The cheek and heart muscles of cattle are the seats where the beef measle, which produces tapeworm in man, is found most frequently. Accordingly these parts are sliced in every instance so that no cow or steer effected with measles shall escape detection. These particular procedures are cited simply to indicate the pains taken to make the post-mortem inspection a thorough one. All the organs, as well as the carcass, are covered by this examination. If, on the completion of this inspection, the meat is found to be sound and fit for food, the carcass is passed, and marked "U. S. Inspected and Passed" with the official number of the establishment at which it was slaughtered. The brand used for thus marking the carcasses is circular with the above legend in abbreviated form, and is stamped with a purple ink on the principal parts of the carcass. The ink is absolutely harmless.

### ALL CONDEMNED MEAT DESTROYED IN GOVERNMENT-SEALED TANKS

If an animal is affected with disease or other objectionable condition, whether it be slight, extensive, local or general, the inspector marks it with a serially numbered U. S. Retained tag. Carcasses and parts so marked are officially in the custody of the inspector and are transferred to what is designated the final inspection room or place where all the facilities necessary for the thorough examination of such carcasses are provided. The final inspection and disposition of retained carcasses and parts is a very important duty; therefore, only those veterinary inspectors who are the most experienced in the work are assigned to its performance. If the final inspection shows the meat to be unfit for food, the carcass and the parts are condemned and plainly marked "U. S. Condemned," by means of a large metal brand. All condemned meats and products remain in the custody of the inspectors and are destroyed under Bureau supervision by conversion into fertilizer and grease in government-sealed rendering tanks. If the condition for which the carcass is retained is found to be local, the affected parts are condemned and the remainder of the carcass is passed.

### LABELS MUST BE APPROVED

The products inspection, as it is termed, covers the inspection and reinspection of meats and products from the time of slaughter through the succeeding processes of preparation and storage, including supervision of all operations to insure the sanitary handling of all edible materials. This supervision also extends to the spices, curing agents and other ingredients used in the products. None but those permitted under the regulations may be added. In order to see that the regulations are strictly observed, a system of frequent collection of samples for laboratory examination without notification to the establishment is maintained. The products inspection also includes supervision of the branding and labeling of meats and products. The use of labels bearing false or misleading names or statements is prohibited; in fact, only those labels which have first been submitted to the Bureau and approved by it may be used. The contents of the package must conform to the statements on the label.

The sanitary requirements prescribed and enforced under the meat inspection regulations constitute a highly important part of the federal system. The Meat Inspection Act confers upon the Secretary of Agriculture authority to prescribe and enforce such regulations at all establishments at which inspection is maintained. The more important of these requirements are adequate and proper toilet and lavatory and dressing-room accommodations, and also smooth and impervious surfaces for operating rooms and equipment. Other requirements include good light, adequate ventilation, modern plumbing, efficient drainage, complete separation of rooms in which edible products are prepared from those in which inedible materials are handled, and pure water with ample facilities for its distribution. The requirements enumerated indicate the character of the sanitary regulations. Their purpose is to insure strict cleanliness in the preparation and handling of meats and meat food products, and for the maintenance of clean and wholesome conditions in and about the establishment. Since the present meat inspection act became effective the establishments in the United States at which federal meat inspection is maintained have expended in the aggregate many millions of dollars in order to conform to the standard set by the regulations. It has been money well spent. The difference between a modern sanitary plant operating under inspection and the country type of slaughter house operating without inspection of any kind can hardly be described. It needs to be seen to be adequately and properly appreciated. The regulations governing sanitation were framed on progressive lines,

so that they not only serve the present needs, but also provide for the attainment of still better standards for the future. When new plants are to be erected or old ones reconstructed it is aimed to have the best standards followed; accordingly, it is required that the plans and specifications for the same be submitted to the Bureau for examination and approval.

IMPORTANT FACTOR IN FOREIGN TRADE

While federal meat inspection is primarily a service in hygiene and sanitation, it occupies, nevertheless, an important position in our trade economics, and is the agency through which a very important part of our export commerce has been maintained. Without its certificate of inspection the export trade in meats and meat food products would be seriously impaired. The amount of beef, pork and mutton certified for export in the fiscal year 1918 exceeded a total of 2,500,000,000 pounds, while the certification for the fiscal year 1919 will approximate 3,400,000,000 pounds. The figures do not include the shipments made to the American expeditionary forces in France. Exports have been tremendously stimulated by the war; however, under normal conditions the United States imports as well as exports great quantities of meats. All the imported meats are subjected to an adequate inspection under the federal system.

An economic importance possessed by federal meat inspection, but to which only casual reference can be made at this time, is the relation of its post-mortem records to the locating of territories in which food animal diseases prevail to an unusual extent, and the eradication of which is to be attempted.

A further point in regard to the economic value of federal meat inspection is the moderate cost at which it is maintained. The first aim is to make the service efficiently fulfill the purpose for which it is intended; the second, to administer it with due regard to economy. In computing unit cost of maintenance the federal system has the advantage of a very large volume of operations, and it will be gratifying to the taxpayer to learn that largely owing to this advantage the service is maintained at a cost of less than six cents for each animal inspected. This sum covers the expense of all the inspections from that of the live animal to the final examination of the finished products.

STUDY OF LOCAL INSPECTION

Lately the Bureau has completed a survey of municipal and state meat inspection. About one-third of the meat consumed in the United States is slaughtered and sold within state boundaries and, therefore, is not subject to federal inspection. This is a condition which local authorities must handle. The results of the survey include some highly interesting facts and figures, and to make them available to members of the association I have requested our Mr. Roberts to furnish the association with a copy of the findings.* You will learn that the majority of cities have no inspection of their meats. The reasons for the absence of local supervision in many cities include lack of funds and lack of sufficient interest. Apparently health considerations alone have failed to rouse cities to the importance of having local meat establishments inspected. It is not within my authority to say what should be done, but this much is certain; the inspection is needed as the facts show and as all who are familiar with average slaughter-house conditions will quickly admit. Their interest in health alone fails to get results; possibly some additional fact may be found and used as a means of obtaining and holding the necessary support.

Municipal and state meat inspection is a field where a great deal of constructive work remains to be done. It is paramount for health reasons and the health side appeals to many people. Yet the economic side may appeal to a great many more. This briefly is the thought I want to leave with you. Human welfare is

*The paper by Mr. Roberts, "State and Municipal Meat Inspection," is to appear in a future issue of the JOURNAL.

the common cause we are serving. Methods of livelihood have produced what are commonly called "industrial classes" and also terms like "producer," "consumer," and "distributer." Each group has its problems in which it is deeply interested and many of which are vital to human happiness. In attempting to carry certain lines of scientific work before the public we may wisely study the aims of these groups, thus meeting with coöperation which may simplify many a knotty problem and hasten the successful solution of others.

# OBSERVATIONS ON THE DIPHTHERIA VIRULENCE TEST IN PUBLIC HEALTH WORK

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Presented before Laboratory Section, Amer. Pub. Health Asso., at Chicago, Ill., December, 1918.

**These authors advocate tonsilectomy where virulent diphtheria bacilli persist in throats with adenoids or enlarged tonsils. Diphtheria bacilli of well persons are rarely virulent unless these persons have associated with cases of diphtheria. Organisms are almost always virulent in persons sick with the disease and their associates.**

Definite detailed study of the bacteriology of the diphtheria bacillus following its discovery and identification by Klebs-Loeffler in 1883-4 was prompted and augmented by the publication in 1899 by Wesbrook, Wilson and McDaniel[1] of their classification of the diphtheria bacillus. This classification gave a common ground for the discussion and comparison of different types. With this classification for a basis the Massachusetts Association of Boards of Health appointed, in 1900, a committee with an extensive representation in the various public health laboratories of that time, to determine the relationship of the different types, their prevalence and significance. The report[2] of this committee in 1902 showed tremendous variations in the diagnostic value of the different types and in their prevalence in both the sick and the well as reported by the various laboratories. For example, in well persons the presence of diphtheria bacilli was reported in 22% in Washington, D. C., but only 9% were granular organisms. In Providence, R. I., there were .43% granular organisms, 3% including barred forms and 25% including all forms, but there were actually reported positive 9%. In Boston 1.01% were reported positive. In Minnesota at that time there were reported positive 3.72% in institutions where cases had occurred and 3% in institutions in which no cases had recently occurred.

In 1910 this Association appointed a committee to study the same subject with an idea of standardizing diphtheria diagnosis. The committee was never able to complete its work.

Two extensive studies on the occurrence of diphtheria bacilli in well persons have been made since this time, one in Boston[3], in 1911, and the other in Detroit, Michigan,[4] in 1915. In Boston

4444 school children were cultured at the opening of schools in September and 2.3% found to harbor diphtheria or diphtheria-like organisms. In Detroit a house-to-house culturing campaign was made and of 4093 persons cultured .928% were reported positive.

A study of the virulence of the organism in each case was planned in each of these studies, but for various reasons only a few of the cultures were tested for virulence in the Boston study. In Detroit one-half of the 38 cultures were tested and 2 found to be virulent. Supposing 2 more virulent cultures would have been found out of the other 19 positives there would be .097% of the total persons examined found to be harboring virulent diphtheria bacilli.

The value of the virulence test depends upon the non-variability of the organism. Goodman[5] in 1908 claimed he could produce from the same colony by artificial cultivation 2 strains widely divergent in acid production. In 1912 Berry and Banzhaf[6] showed that the divergence in Goodman's study was due to environment. They could get no true change in acid production or in virulence. Dr. Anna Williams, after much work, never succeeded in changing the virulence of diphtheria bacilli. Schofield[7] endeavored to change virulent organisms to non-virulent by exposure to drying and sunlight, but got no change after 30 days' exposure to sunlight and 60 days to drying in the dark. Kolmer[8] reporting on a large series of virulence tests concluded that an avirulent organism never became virulent; those of low virulence might become more virulent by passage from person to person and that exceptionally virulent organisms become non-virulent. However, it is occasionally found that both virulent and non-virulent organisms are present in the same throat culture, which might account for an apparent change of virulent to avirulent forms.

The present study covers two groups of persons; the first group being persons admitted to the State University Hospital for various ailments other than infectious diseases, and the second group being persons exposed in schools or in public gatherings to persons having diphtheria.

**Group I.** From Feb. 1, 1914, to Sept. 30, 1918, there have been cultures taken from 6960 persons on admission to the hospital, and of these 152, or 2.18%, have shown diphtheria or diphtheria-like organisms. Three clinical cases occurring in the hospital during this time are omitted. Virulence tests have been made on 132 of the 152 and of these but 10 or .14% of the total persons examined showed the presence of virulent organisms. The history of these 10 cases is as follows:

Two had abnormal condition of tonsils—enlarged and inflamed.

One had enlarged tonsils with membrane formation which was undoubtedly true diphtheria infection.

One had mild pharyngeal disturbance with chronic nasal catarrh.

Two came from families where clinical diphtheria existed.

One was exposed to a clinical case removed from next seat in school and had had sore throat.

One was admitted to hospital with paralysis, which increased; had had sore throat previously, without medical attention.

One in hospital because of heart disease, gave no history of known exposure at any time and had no symptoms; worked as night watchman in a coal yard. Cultures were positive over a period of three weeks; then three negative cultures were obtained.

One in hospital with carcinoma of tongue. No history obtained.

**Group II.** In this group of persons exposed more or less intimately in public places to clinical cases there were cultures taken from 12,897. In 393 cases, or 3.05%, the diagnosis was returned positive. Because of stress of work, virulence tests were not made in all of these cases, but when made it was found generally true that only those persons most intimately associated with the sick person, usually in the same family, or school companions, harbored virulent organisms. This is illustrated in one of

our State institutions where delay in the cultural control of an epidemic of diphtheria occurred. In that case our proportion of virulent cultures increased to .6%.

This same relationship of virulence to symptoms, or to direct exposure to persons sick with diphtheria, is shown very clearly in a tabulation of all of our virulence tests made in routine work. Since January 1, 1914, there have been 1082 cases tested by the subcutaneous inoculation of guinea pigs, using as far as possible two strains from each case. The tabulation of these cases as given below shows 85% of the virulent cultures to come from persons having had clinical diphtheria, 14.1% from persons intimately associated with clinical cases and .9% only from well persons. Of the non-virulent cultures 97.4% were from persons without symptoms and without close association with clinical cases, .5% from persons exposed to clinical cases and 2.1% from persons with symptoms of diphtheria.

| | Positive | Negative | Total |
|---|---|---|---|
| Clinical cases | 561 | 9 | 570 |
| Exposed to clinical cases | 93 | 2 | 95 |
| Nonclinical or well persons | 6 | 411 | 417 |
| Total | 660 | 422 | 1,082 |

The six well persons with virulent organisms include three persons with some abnormalities of the upper air passages, one person without any symptoms or any known exposure to virulent infection and two persons in whom there were no symptoms but whose history regarding exposure was not obtained.

The two persons harboring non-virulent organisms and who were exposed to clinical cases do not need consideration, as it is quite possible to conceive of well carriers of non-virulent organisms being exposed to cases of diphtheria without becoming infected from the sick person.

The 9 cases found to be harboring non-virulent organisms in the presence of symptoms give the following histories: Six had mild symptoms of tonsilitis varying in duration from 2 to 3 days; two had tonsilitis with exudate present 1 and 2 days, respectively; and one had a mild attack of diphtheria 47 days previously.

We may conclude then that virulent organisms are found almost invariably in persons with clinical symptoms of diphtheria and in well persons intimately associated with them. In well persons who have not associated intimately with infected persons, the organisms, while diphtheria-like, are avirulent. This agrees with the conclusions drawn by Weaver[9] on a series of 50 cases in Chicago.

### TONSILECTOMY IN RELATION TO CHRONIC CARRIERS

The clearing of diphtheria infection from the upper air passages of chronic carriers has been a very serious problem to most physicians. After a fairly extensive trial of various bacterial sprays, the most frequently used being *Staphylococcus pyogenes aureus, B. Bulgaricus* and various yeasts, these were discarded. In 1915 Ewart[10] in England tried jasmin oil, running it into the nose down over the nasopharynx and filling the sinuses with it. In 1916 kaolin was advocated. Extensive use of this material was made by Rappaport[11], who showed that its value depended wholly upon its adsorptive properties. Therefore, the drier the kaolin the better the results. He recommended drying the kaolin in an oven and blowing it while warm into the nostrils and throat at two-hour intervals, washing out the old kaolin before each administration with a weak antiseptic solution. While this procedure gave good results at times it was not effective where tonsils were found enlarged or adenoids present. In such cases surgery must be resorted to. Ruh, Miller and Perkins[12] report tonsilectomies in 19 cases without ill results.

We have a series of cases beginning February, 1915, in which cultures taken before and after the operation have been examined in this laboratory. The

results have been so satisfactory that we do not hesitate to suggest tonsilectomy to any physician caring for a chronic carrier.

Our series of cases may be divided into two groups: (A) Those encountered in our routine work and scattered over the State; and (B) patients in a State Hospital where, following an epidemic of diphtheria, tonsilectomy was performed on all persons with enlarged tonsils who had harbored diphtheria bacilli.

In group A there are 22 persons, 8 males and 14 females, varying in age from 9 to 36 years. Fifteen of the cases had had clinical symptoms and 7 had not been sick, but had been exposed intimately to clinical cases. The virulence of the infecting organisms was tested in all but two of the cases and in each instance the organisms were found to be virulent for guinea pigs.

From date of first symptoms, or in cases of exposure without symptoms from date of first positive culture to tonsilectomy, the lapse of time varied from 14 to 276 days. Omitting two cases in which the periods were 14 and 20 days, respectively, the average duration was 124 days. Of the 22 cases, 13 cleared up at once and cultures taken, 1, 2, 3, 3, 3, 4, 7, 7, 7, 8, 10 and 23 days later respectively, were negative as well as later cultures from each case. In six cases tonsilectomy was followed by 1 positive culture 4, 5, 6, 8, 9 and 10 days later, respectively, later cultures being negative. In three cases the results of the operation were not as marked; one having positive cultures on the 3rd, 7th, 15th, 18th and 24th day later, becoming negative on the 30th day; and a sister of this one having a positive culture on the 7th day and on the 18th day a positive nose culture (throat being negative), and becoming negative on the 24th day. In both of these cases, cultures from the nose gave the positive findings largely and it is quite possible that all adenoid tissue was not removed at operation. In the third case cultures were taken at irregular intervals, but were positive on the 14th, 29th and 95th day after operation and were negative on the 115th day and later.

Group B includes cases in which tonsilectomy was performed in all cases that had harbored diphtheria or diphtheria-like organisms an excessive time following the cessation of an epidemic of diphtheria in the institution. The epidemic was confined to the women's side. Some cases with enlarged tonsils were operated upon, although cultures had become negative, but these are not included in this series. Twelve cases not sick and not exposed intimately to diphtheria infection, mainly among the male patients, but who had diphtheria-like organisms in cultures, were also operated upon because of abnormal throat conditions and these are dealt with separately later.

In this group there were 7 cases, all of whom had been sick or had associated with clinical cases. All were females. In 6 the organism was shown to be virulent by animal tests; in one no virulence test was made. The lapse of time from first symptoms or first positive culture to operation varied from 52 to 159 days, averaging 92 days. In 6 the cultures following tonsilectomy were all negative, four taken on the 6th day, one on the 25th and one on the 35th. It is unfortunate that cultures were not taken earlier from the two last named. In one, cultures were positive on the 6th, 7th, 8th, 16th and 19th day and negative on the 20th day and later.

The twelve cases referred to above, without symptoms and without association with cases, are interesting to compare with the above series of cases. There were 9 males and 3 females; virulence test was negative on 10 and not made on two of the males. Duration from first positive culture to tonsilectomy averaged 175 days. In only one of the twelve cases was the operation followed promptly by negative cultures. In six cases examined from 1 to 3 months later, cultures were still positive, in one examined 3½ months after operation,

culture was negative, and the remaining three were not examined later than the 5th to 10th day at which time they were positive.

CONCLUSIONS

(1) While diphtheria or diphtheria-like organisms are found in from 2% to 3% of well persons these organisms are very rarely virulent unless the individual has associated intimately with persons sick with diphtheria.

(2) The organisms are virulent almost invariably in persons convalescent from diphtheria and in persons intimately associated with cases or convalescents.

(3) Where virulent diphtheria bacilli persist in persons with enlarged tonsils and adenoids, operation is usually an efficient method of getting rid of the infection.

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6. Berry & Banzhaf. Jour. Inf. Dis. X. 3. p. 409.
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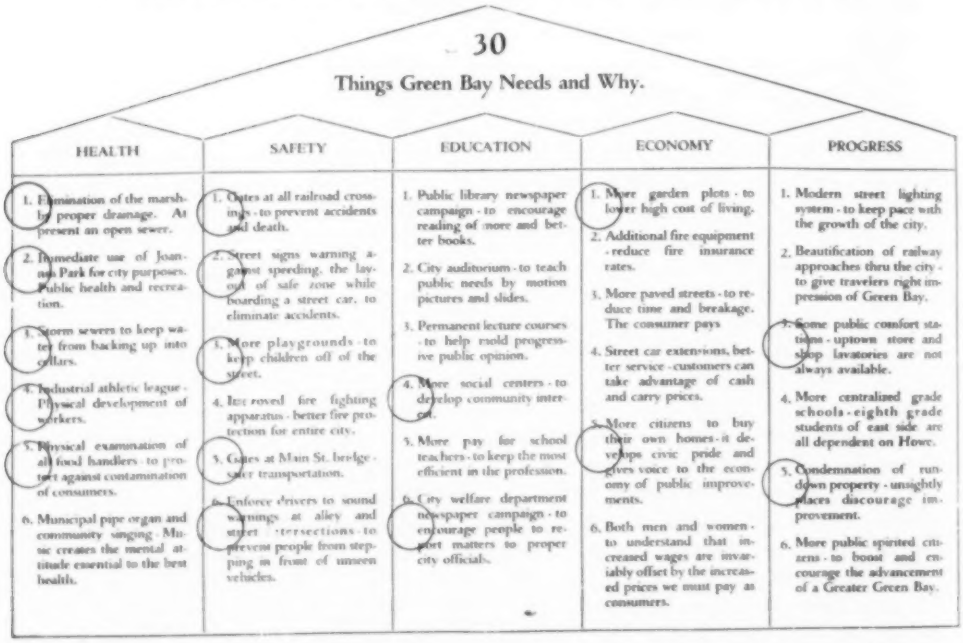
## APPRECIATION OF PUBLIC HEALTH NEEDS AT GREEN BAY


30
Things Green Bay Needs and Why.
HEALTH
1. Elimination of the marshes by proper drainage. At present an open sewer.
2. Immediate use of Joanis Park for city purposes. Public health and recreation.
3. Storm sewers to keep water from backing up into cellars.
4. Industrial athletic league - Physical development of workers.
5. Physical examination of all food handlers - to protect against contamination of consumers.
6. Municipal pipe organ and community singing - Music creates the mental attitude essential to the best health.
SAFETY
1. Gates at all railroad crossings - to prevent accidents and death.
2. Street signs warning against speeding, the layout of safe zone while boarding a street car, to eliminate accidents.
3. More playgrounds - to keep children off of the street.
4. Improved fire fighting apparatus - better fire protection for entire city.
5. Gates at Main St. bridge - safer transportation.
6. Enforce drivers to sound warnings at alley and street intersections - to prevent people from stepping in front of unseen vehicles.
EDUCATION
1. Public library newspaper campaign - to encourage reading of more and better books.
2. City auditorium - to teach public needs by motion pictures and slides.
3. Permanent lecture courses - to help mold progressive public opinion.
4. More social centers - to develop community interest.
5. More pay for school teachers - to keep the most efficient in the profession.
6. City welfare department newspaper campaign - to encourage people to report matters to proper city officials.
ECONOMY
1. More garden plots - to lower high cost of living.
2. Additional fire equipment - reduce fire insurance rates.
3. More paved streets - to reduce time and breakage. The consumer pays
4. Street car extensions, better service - customers can take advantage of cash and carry prices.
5. More citizens to buy their own homes - it develops civic pride and gives voice to the economy of public improvements.
6. Both men and women - to understand that increased wages are invariably offset by the increased prices we must pay as consumers.
PROGRESS
1. Modern street lighting system - to keep pace with the growth of the city.
2. Beautification of railway approaches thru the city - to give travelers right impression of Green Bay.
3. Some public comfort stations - uptown store and shop lavatories are not always available.
4. More centralized grade schools - eighth grade students of east side are all dependent on Howe.
5. Condemnation of run-down property - unsightly places discourage improvement.
6. More public spirited citizens - to boost and encourage the advancement of a Greater Green Bay.

Green Bay, Wis., has 30 things that it really needs, according to the *Northern Lights*, published in that city, from which the attractive listing of them here presented is taken. Of these 16 items, which the *Journal* has emphasized with the ring, are practical factors to health and safety. It is an up-to-date community that can consider seriously such matters as these, but Green Bay goes further and considers important improvements in other departments of public work.

# SOME EPIDEMIOLOGICAL POINTS REGARDING ACUTE RESPIRATORY DISEASES

FRANK OVERTON, M. D., D. P. H.,

*Patchogue, N. Y.*

**Customary measures for control of infections often shut the stable door after the horse is gone. Epidemics are frequently not recognized till the mischief is done. People must learn to practice the hygienic measures that will protect them. Real prevention needs the intelligent coöperation of every individual in a community.**

ACUTE respiratory diseases have commonly been named according to the anatomical location of their lesions. Medical text-books confuse students by making separate entities out of rhinitis, pharyngitis, tonsilitis, bronchitis, and pneumonia, as if they were unrelated conditions. The modern conception of these diseases is that they are infectious; that they are caused by a number of different varieties of organisms; and that any organism may produce a lesion of any part of the respiratory tract and of any degree of severity. The scientific method of nomenclature would be to name each acute respiratory disease according to the species of organism which causes it, as in naming the acute infections of the intestine. The epidemiologist would like to know the identity of the organisms of every case of acute respiratory disease, in order to isolate and control those patients who harbor virulent organisms. Since he is usually unable to secure this identification, his alternative choice is to seek to secure some control over every case of acute respiratory disease. Even if accurate diagnostic methods were available, a delay of at least a day or two will always be necessary before the tests can be reported; and in the meantime there should be some degree of control over the case. The control of every case, or of the infective material from it, offers the only prospect of preventing diseases of the respiratory organs. This is impracticable and impossible at the present time, owing to the ignorance of most people regarding the infectiousness of colds and other forms of acute respiratory diseases. Physicians do not usually treat the diseases as infectious processes, and still less do the people generally consider them to be transmissible. The basis for their control must be the education of the people regarding their infectious nature and the means of their transmission. The present failure of public health measures to control influenza is due principally to the ignorance of the people and their inability to understand the reasons for the preventive measures.

## MEANS OF SPREAD

Physicians and the people need to be taught that the only way in which coldness, dampness, and fatigue influence the onset of acute respiratory diseases is by producing susceptibility to them, and preparing the soil for the growth of the infecting organisms. It is necessary to emphasize the two facts that the diseases will not develop unless the organisms are planted in the body, and that the organisms come

from the discharges of the noses and throats of affected persons. The likelihood of transmitting the infection increases with the virulence and abundance of the organisms, and the closeness of the contact with the infecting case, as it does in any other disease. It was found at Camp Upton, for example, that if a case that developed into pneumonia was left in a barrack until a diagnosis of pneumonia was made, there would usually be other cases of pneumonia and also a series of milder cases of diminishing severity down to what appear to be mild colds; but if the original case was discovered and controlled early, few other cases developed.

A case of acute respiratory disease can transmit the disease from the time of the onset of symptoms. A person coming down with a cold usually goes to business for hours or days, mingles with others without restraint, sneezes, coughs, and spits promiscuously, and spreads infective material widely and indiscriminately. By the time he is disabled and goes to bed, he has exposed an unknown number of other persons to infection. Public measures and physicians cannot reach mild cases, or severe ones in their early stages. The remedy is education to such a degree that the majority of persons habitually consider colds to be infectious, and sneezing and coughing to be public warnings of danger to the community.

### PERIOD OF INCUBATION

It is well established that influenza has an incubation period of two days. It is probable that most other acute respiratory diseases also have a two-day incubation period. Contrast this period with the two-week period of incubation of measles and most other common infectious diseases. At the end of two weeks when secondary cases begin to follow a primary case of measles, a primary case of influenza may have been followed by the seventh generation of cases. An epidemic of influenza two weeks after the appearance of a primary case is usually in the same stage as an uncontrolled epidemic of measles three months after the primary case. The usual course of events in an epidemic of influenza is shown in the accompanying table from *Health News,* New York State Department of Health, September, 1919.

There is nothing to call special attention to the development of an epidemic until about the 10th day when a death occurs. A few cases of pneumonia are then recognized and rumors begin to spread that colds are prevalent. Yet the epidemic is then at its height, and nearly every susceptible person has been infected. Only a few scattered cases of influenza have been discovered, and yet a total of 364 cases may have been infected, if each case infects only three others. On the 12th day the funeral of the primary case makes an impression, a number of pneumonia cases are reported, and public health agencies begin to be active. The explosiveness of the outbreak is often mentioned, and yet the cases have developed through an orderly series of six or seven generations. There are heated discussions regarding the value, or futility, of preventive measures; but the onset of new cases naturally stops because nearly all susceptible persons have been exposed, and about all that remains to be done is to treat the pneumonia cases that remain.

### PREVENTION

The preventive measures against acute respiratory diseases are the same as those against other communicable diseases, and include the discovery of cases in their early stages, their isolation to some degree, and the careful and strict disposal of the excretions of their noses and mouths. The disease most analogous to acute respiratory

diseases is measles. Success in preventing this disease depends on recognizing cases in their incipiency three or four days before the eruption appears. This is notoriously difficult in measles, and is still more so in such a disease as influenza. The situation in influenza is still more complicated by a two-day period of incubation. If we wait for severe symptoms to appear, as we have been doing, we will be about two generations behind in our discovery of cases. Our efforts will be of no avail if every case which we discover has left an undiscovered series of secondary and tertiary cases behind it. Speed is absolutely necessary in preventing or controlling an epidemic.

The protective measures are based on preventing the transfer of excretions of the nose and throat from one person to another, and include isolation, the disposal of sputum, covering the nose and mouth during coughing and sneezing, and cleanliness of dishes, toilet articles, and the person. A whole page of rules might be written regarding what to do and avoid, but they may be summed up in the rules of *good manners and good housekeeping*.

Preventive measures against acute respiratory diseases require the intelligent cooperation of every individual in a community. The attitude of each person must be to report sickness, rather than conceal it; to respect suspicious signs of sickness, rather than ignore them; to impose some degree of self-isolation, rather than mingle closely with others; and to observe personal hygiene, rather than assert an excessive degree of personal liberty and independence. Prevention at present depends upon individual in-

SEQUENCE OF EVENTS IN A TYPICAL OUTBREAK OF INFLUENZA: SUPPOSING THAT EACH CASE INFECTS ONLY THREE OTHERS.

| 1st day | 2d and 3d days | 4th and 5th days | 6th and 7th days | 8th and 9th days | 10th and 11th days | 12th and 13th days |
|---|---|---|---|---|---|---|
| 1 Primary case | 3 Secondary cases. | 9 Tertiary | 27 Fourth series | 81 Fifth series | 243 Sixth series | 729 Seventh series |
| The original or primary case comes to town with a slight cold | The primary case begins to feel sick. | Primary case sends for physician. | Primary case goes to bed. | Primary case reported as pneumonia. | Primary case dead. | Funeral of primary case. |
| | Secondary cases begin to have slight cold. | Secondary cases begin to feel sick. | Secondary cases send for physician. | Secondary cases go to bed. | Secondary cases begin to have pneumonia. | Secondary cases begin to die. |
| | | Tertiary cases begin to have slight colds. | Tertiary cases begin to feel sick. | Tertiary cases send for a physician. | Tertiary cases go to bed. | Tertiary cases begin to have pneumonia. |
| | | | Fourth series of cases begin to have slight colds. | Fourth series of cases feel sick. | Fourth series of cases send for a physician. | Fourth series of cases go to bed. |
| | | | | Fifth series of cases begin to have slight colds. | Fifth series of cases feel sick. | Fifth series of cases send for a physician. |
| | | | | | Sixth series of cases begin to have slight colds. | Sixth series of cases feel sick. |
| | | | | | Health officer gets the first reports of a few of the worst cases. Rumors that everybody in town has a cold. Outbreak is really at its height. | Seventh series of cases begin to have slight colds. H. O. gets a number of reports of cases. H. O., Red Cross and other public health agencies begin to get busy. The number of new cases begin to diminish on account of the lack of susceptible persons. |

itiative rather than public measures, but in future years we may expect a growth in education and public sentiment which will lead to the adoption and enforcement of public measures that are now left to the undeveloped consciences of individuals. The time will come when the majority of persons know as much about the elementary facts of the diseases as the few advanced thinkers now know.

Public health workers are prone to emphasize what is not known about acute respiratory diseases, and hesitate to apply a comprehensive plan of prevention based on what is already known. We do not need to wait to discover a short cut to prevention and to devise new measures the observance of which will atone for our personal sins of omission and commission along hygienic lines. The history of all vaccines and serums demonstrates that people generally use them only as a last resort. The prevention of typhoid fever, for example, still depends principally on sanitary measures. It would still be necessary for individuals to observe general hygienic measures for the prevention of acute respiratory diseases even if a potent vaccine or serum were discovered. The time is ripe for departments of health and education to develop a plan for public education regarding the elementary facts concerning the diseases, and to arouse the people generally to practice the hygienic measures which will protect them from the diseases.

# ENDEMIC GOITER AS A PUBLIC HEALTH PROBLEM; ADDITIONAL NOTES

MAYO TOLMAN,

*Health Director, Community Councils of National Defense, New York City*

The article appearing in the July, 1919, Journal of the American Public Health Association on "Endemic Goiter as a Public Health Problem," seems to have stimulated considerable interest, as the writer has received numerous inquiries regarding his experience with goiter in West Virginia, and, in fact, has received applications from sanitary experts to make special investigations on a regular fee basis. Also he has received a correction regarding one of his statements, which correction should be quoted in full:

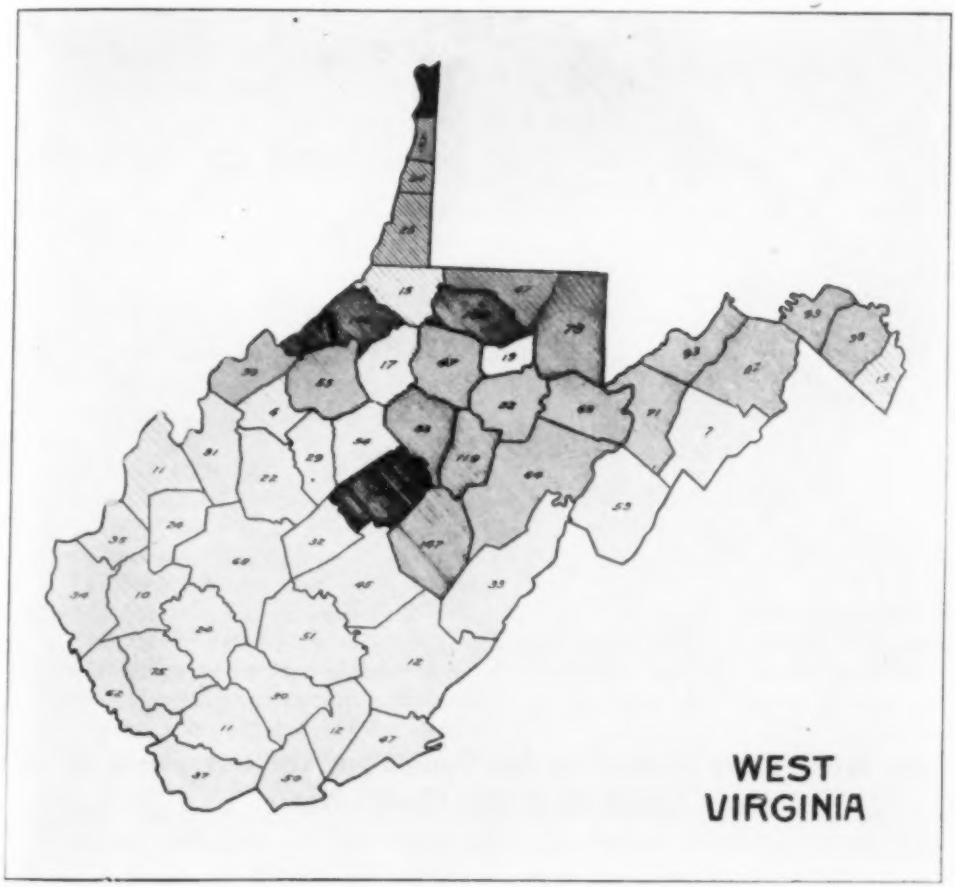
> The author refers to Edmonton, Province of Alberta, Canada, as being a location of the highest endemicity of the disease. * * * The region to which his remarks may properly apply is not Edmonton, the capital of the province, but a district in the province near the foothills west of Calgary, and not less than 230 miles from Edmonton. This is the district surrounding a small town called Cochrane, where goiter does seem to be more than ordinarily prevalent. * * * Mr. Tolman's information was probably derived from the statements made by Dr. Ritchie of Cochrane, recently deceased, who has been responsible for making grossly exaggerated and unscientific statements regarding the prevalence of goiter in Alberta, and which were shown to be such by a special investigation ordered by the Dominion government. Dr. Sheppard of McGill University, who carried out this investigation, in his report did not support Dr. Ritchie's statements regarding goiter in Alberta and by resolution carried unanimously at the meeting of the Alberta Medical Association, held in Calgary in 1918, the medical practitioners of the province expressed absolute disagreement with the extreme views of the prevalence of goiter published by Dr. Ritchie as being unscientific and unreliable and not in accordance with facts.

The writer has not been able to locate his original source of the statement re-

garding Edmonton, although he does find the statement that the city is in a goiterous area in a Mineralogical Bulletin published in Massachusetts in 1884.

Quite recently Drs. McCord and Walker of the University of Cincinnati prepared an extensive and valuable article, which was printed in *Modern Medicine* for February, 1920. This article quotes the work of Clark and Pierce in West Virginia, where they made studies in 11 counties. Consequently, it may be of interest to present at this time a map of West Virginia showing the relative intensity of goiter as determined by a survey made by the State Department of Health in 1918. Return postcards were sent to every doctor in the state requesting a statement as to the number of cases of goiter in his practice. Replies were received from some 60% of the physicians, and the reported cases were plotted in the area covered by the particular physician's practice.

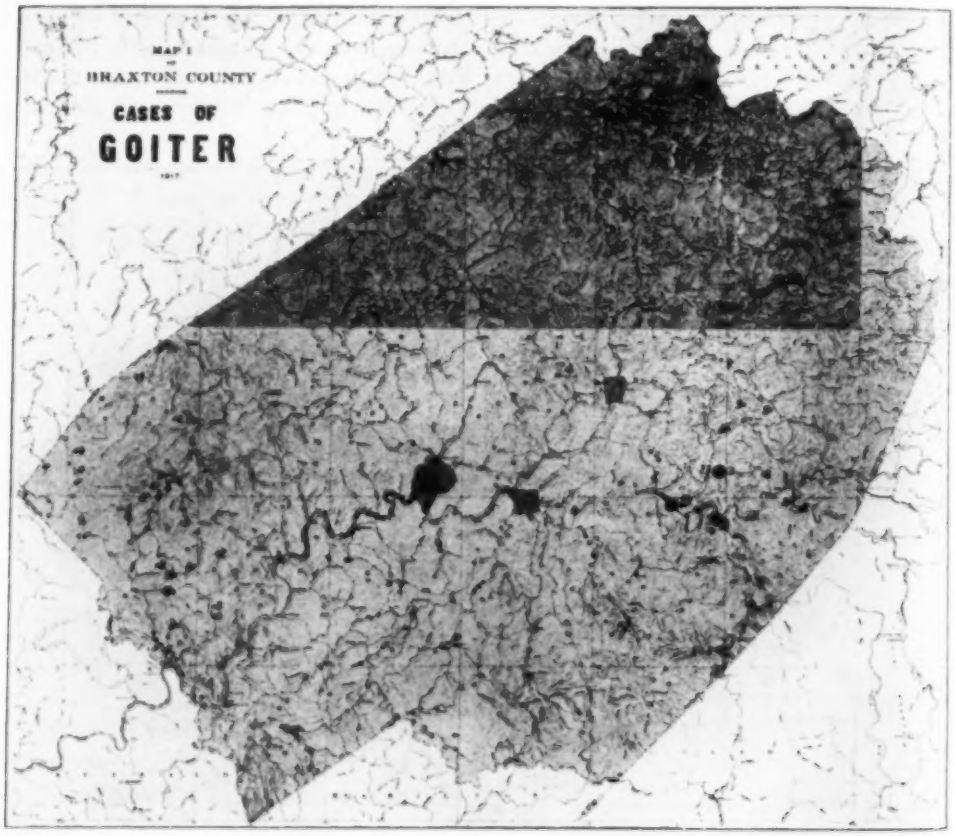
While it is recognized that this is not an accurate method, it is felt that the results obtained at least have some value. The counties along the eastern edge of the state are largely in a limestone area, while the belt through the central part of the state is underlain by coal measures. The western edge of the state is not in the coal measures, except in the northwest corner, where it may be noted that the intensity of goiter again becomes very high. As stated in the earlier articles, this greater intensity in the coal



areas over that in the limestone region is contrary to the general experience of most investigators.

The July article referred to the house-to-house survey in Braxton County. The accompanying map shows the results of this survey, and it can readily be seen how closely it follows the stream beds. Of course, the majority of houses are to be found along the streams, but still there are enough people dwelling well up on the mountain sides to make the greater incidence along the creeks quite noticeable. It is interesting to observe that the northeast corner of the county is but slightly affected. This area is entirely out of the coal measures, being largely in a red sandstone.

It seems to the writer possible that a careful spectroscopic study of the vapors of water from known goiterous wells and from wells known to be free from the goiter-producing characteristic, might be productive of interesting results, and it is suggested that some one thoroughly familiar with the use of this instrument undertake such an investigation.




**For latest news of Membership Campaign, see last pages of text, following Public Health Notes.**

# WATER TREATMENT AT ST. LOUIS, MO.

EDWARD E. WALL,
*Water Commissioner,*
*St. Louis, Mo.*

Read before Sanitary Engineering Section, American Public Health Association, at New Orleans, La., October 28, 1919.

**With three kinds of water, Mississippi, Missouri and Illinois rivers, of different natures, and coming in an infinite variety of mixtures, St. Louis has peculiar water supply problems. This outline of methods will interest water engineers. Of the success of the St. Louis methods, the low mortality rates of the city are evidence.**

FROM the date of the first daring attempt to clarify the Mississippi river water by coagulation followed by plain sedimentation; to the present time when water from the same source is settled, softened, coagulated, settled a second time, coagulated again, filtered and sterilized; there has been throughout all the wide range of study and experiment accompanying this evolution the same continuous variation in the numerous elements both chemical and physical entering into the composition of this impure and objectionable fluid.

It is true that the variation in all these elements is confined within certain limits, but the possible combinations between quantities and kinds are innumerable, so that any treatment to be successful must be of such a nature as to be readily modified in order to meet the changes resulting from the irregular mixing of the waters of the three great rivers that meet a few miles above St. Louis, viz, the Mississippi, the Illinois and the Missouri.

The upper Mississippi river receives the overflow from an immense area of lakes and swamps in northern Minnesota and Wisconsin, which gives the water its high color due to dissolved organic matter leached out of fallen leaves, twigs, limbs, pine needles, the cones of cedar, hemlock and tamarack and from the grass and undergrowth of those flat lands. Farther down it drains prairies, forests and fields, receiving the underground water from the sandstone and limestone districts.

The Illinois river drains a prairie district, an almost level agricultural area, so that both it and the Mississippi flow with a less rapid current than the Missouri and carry a much smaller quantity of suspended matter, but more finely divided than is the case with the Missouri.

The upper Missouri river flows through a forested region of mountain valleys and deep canyons into gradually widening bottoms, draining an area lower down where there are no trees, carrying at all times large quantities of sediment because of bank and bed erosion. It also carries a considerable quantity of dissolved matter taken up in the flow of surface drainage over and through alkaline soils.

The quantity of rainfall each year and its distribution, in point of time and season, over each of the drainage areas of these rivers determines the character of the water at the St. Louis intake.

In general the variation in the river water at the St. Louis intake follows certain lines, so that a knowledge of river and weather conditions prevailing at any

time enables the chemist to predicate the treatment at least twelve or fifteen hours ahead with a reasonable degree of confidence. Occasionally sudden and remarkable changes occur, which upset all calculations, and conditions arise which differ from all previous experience. For example, in the autumn of 1911 heavy rainfalls in northern Illinois and Wisconsin, with little or no rain over the drainage area of the Missouri river, brought down from the forest and swamp lands of the upper Mississippi valley a flood of highly colored water, which the treatment at that time failed to reduce to a point where the water could be considered as unobjectionable. No such an unusual amount of color in the river water has occurred since.

The difference in color, turbidity, hardness, suspended and dissolved solids for the three rivers are indicated by the following table of averages:

| | Color | Turbidity | Carb. Hard | Non-carb. Hard | Susp. Sol. | Dis. Sol. |
|---|---|---|---|---|---|---|
| Mississippi. | 74 | 173 | 141 | 15 | 119 | 203 |
| Missouri .. | 15 | 1,931 | 143 | 53 | 1,890 | 346 |
| Illinois .... | 20 | 188 | 161 | 40 | 145 | 267 |

The above averages give no idea of the wide range over which each of the above characteristics vary; e. g., color in the Mississippi water is sometimes as low as 30 and again as high as 250; suspended solids in the Missouri river water, range from 200 to 6000; dissolved solids at the St. Louis intake from 160 to 390 parts per million.

It is apparent that water entering the St. Louis waterworks' intake, composed as it is of a mixture of the waters of three rivers draining areas entirely distinct and unalike in character, must show at different times the predominant characteristics of each of the three streams according to their respective stages. The turbid water of the Missouri river, whose mouth is only about five miles above the St. Louis intake, at almost all times flows down the west side of the channel and is but imperfectly mixed with the clearer waters of the Mississippi and the Illinois. Always, there is a very distinct difference in appearance, sharply dividing the two, just below the mouth of the Missouri, which often continues as far south as Sawyers Bend, three miles below the intake.

For this reason the water supply of St. Louis prior to 1915 consisted for a great part of the time of Missouri river water with only a comparatively small amount of mixed Illinois and Mississippi river water added, except at such times as the latter rivers were at higher stages than the Missouri.

This made it all the more difficult to adjust the treatment on those occasions when the Mississippi or the Illinois, or both combined, suddenly brought down water of a high color carrying very fine suspended matter, both of which characteristics being foreign to the Missouri river water, introduced new factors into the problem and often temporarily made it impossible to clarify the compounded waters by coagulation and simple sedimentation.

At the outset of the attempt to clarify the water supply in the spring of 1904, the quantities of chemicals (lime and sulphate of iron), to be applied, were determined empirically, by actual trial on samples taken from the river several times during the day. An excess of lime was always added, which removed all the temporary hardness and left the water slightly caustic. This treatment was capable of producing brilliantly clear water, but had some drawbacks, viz., a rapid coating of the inside of distribution pipes and valves, incrustation on train gears of meters, absolute death to fish in aquariums, through depositing carbonate of lime on their gills and slowly suffocating them; and, so the doctors declared, was productive of stomach troubles in the human family.

The determinations of suspended matter during the first year's attempted clarification, show an average of 30 p.p.m. with a maximum of 97 and a minimum of 0.

Prior to 1904 the water supply of the city, so far as appearance was concerned, was scarcely different from the water in the river. In reality it had passed through the system of settling basins, which ordinarily reduced the suspended matter to probably 150 p.p.m., although there were times, usually in winter or early spring, when the river water was comparatively clear and carried as low as 50 or 60 p.p.m. of suspended matter, and there were also other times of rising water when the suspended matter in the river water reached a figure of 8000 p.p.m. and then the consumer was served with a fluid containing 600 or 800 p.p.m. of sediment, of which Mark Twain said: "Every tumbler full holds an acre of land in solution."

Remembering that the people of St. Louis had been accustomed to using this turbid water for 70 years, it is not surprising that they were exceedingly well pleased with the partially clarified water served in 1904-1905. Each succeeding year saw improvements made in the method of treatment and a better quality of water furnished, until the consumption reached a figure where the settling basin capacity was too small to allow sufficient time for clarification, and there would be periods when an imperfectly clarified water was delivered to consumers. These periods occurred more and more frequently as the consumption increased, and in 1912 the proposition to build filters was seriously considered for the first time, although it had been brought forward and discussed at various times during the half century prior to this date.

For eight years following 1904, the process of clarifying and purifying the river water engrossed the attention of the engineers and chemists of the department. The deficiencies and objectionable features of the treatment, and the resulting troubles, had all been carefully studied and nearly, if not quite all of them, partially remedied or entirely eliminated. But throughout all their earnest and enthusiastic work, and in spite of their strong prejudice in favor of a process first tried out on a large scale at the St. Louis Waterworks, and afterwards elaborated there, and brought to its greatest efficiency; they always came up against the one insurmountable obstacle barring the way to perfectly satisfactory results, viz., the absolute impossibility of continually producing a uniformly clear, potable water. For a great part of the time the treated water was unobjectionable, but lapses from this high standard would occur on account of sudden and unexpected changes in weather or river conditions. After sending the water through the basins in a certain order for some time, high winds or sudden changes in the quantity of water being pumped had a strong tendency to increase the turbidity of the treated water. So that with all the inclination in the world to defend and to perpetuate the St. Louis purification process, the men who were most interested in making it successful were at last forced to admit that it was inefficient and inadequate.

The prime object of treating the Mississippi water was at first to remove the suspended matter. Other advantages resulting from its clarification, such as reduction of bacteria, softening and color removal, were merely incidental. Scarcely any weight was attached to the purification of the water, as the popular idea at that time was that the muddy water was particularly healthful. Its appearance was the objectionable feature. The great commercial value of softening the water was not realized for some time after the initiation of the process, but later became one of the salient features of the treatment, and has been continued in conjunction with the operation of the Chain of Rocks filters.

A very few comparative analyses of the raw and treated water were made during the first year (1904) of the puri-

fication process, and but half a dozen doubtful counts of bacteria made. The department was poorly equipped with laboratory facilities, having neither the necessary apparatus nor competent men to do the work. During the following year considerable equipment was added to the laboratory and monthly analyses made of the river and treated water. The Health Department made monthly sanitary analyses of the water and regular counts of bacteria were made by the City Bacteriologist.

Although the general statement was made that the quality of the water furnished by the Department in that year was practically all that could be desired, the record shows many times when the treated water was turbid; other times when it carried high counts of bacteria and that it showed caustic alkalinity during the greater portion of the year. The use of 8 and 9 grains of lime and 3 and 4 grains of sulphate of iron per gallon of water was of frequent occurrence.

In 1906 many improvements were made in the methods of handling and applying chemicals, the facilities for chemical and bacteriological analyses were largely increased and the working of the whole process systematized. Caustic alkalinity was frequent in the treated water during the first half of the year, but not allowed afterwards. This year marks the beginning of the scientific study of the problem, of accurate and systematic analyses of the water, and of undertaking to determine the quantities of chemicals required, from actual knowledge of the quality of the river water, rather than from a series of empirical tests.

For more than 8 years afterwards the routine of the chemical and bacteriological work continued along the same lines; viz., determination of the governing characteristics of the river water, from which the dosing of the water was determined, and making daily bacterial examinations of the river and treated water. Turbidity, color, neutral carbonates and bicarbonates were determined many times every day, and often the charges of lime and sulphate of iron were changed with each determination.

As illustrative of some of the conditions suddenly arising, and which the ordinary treatment failed to meet successfully, may be mentioned the period in 1911 when after general rains over the drainage areas of the upper Mississippi, the Illinois and the lower Missouri rivers, there first came a rush of very muddy water from the rapid run-off from the steeper slopes of the Missouri, followed by a flood of highly-colored upper Mississippi water mixed with the outflow of the rising Illinois, which crowded the diminishing stream of muddy Missouri water over against the west bank, leaving the intake completely surrounded by a coffee-colored fluid, which condition continued for sixteen days. The sulphate of iron added to the river water for the purpose of coagulating suspended matter was not very efficient for removing color. In the presence of dissolved organic coloring matter, iron is held in solution and its precipitation as ferric hydroxide is considerably retarded, even though excess quantities of lime be used in the treatment.

The very fine suspended matter which characterizes the upper Mississippi water does not readily respond to increased doses of iron sulphate, and the treated water is likely to retain in solution and suspension as much as five parts per million of iron, which is sufficient to discolor the flow from hot water faucets, stain the seams of white goods in laundries, and in many ways be a source of annoyance to household consumers.

Lime is effective in precipitating calcium and magnesium carbonates, producing a softening incidental to coagulation. Increasing the charge above that required to react with the carbonate hardness until enough lime has been added to give a strong caustic reaction, will precipitate a portion of the magnesium as hydroxide. This was not an unusual practice in the

earlier months of the process and resulted in producing a perfectly clear and colorless water. This was discontinued because of the presence of caustic alkalinity throughout the distribution system, and the consequent incrustation in the mains, service pipes, valves and meters, due to after reactions. The action of lime in precipitating calcium carbonate does not effect any color reduction, but the precipitation of magnesium carbonate does reduce color, provided it is not redissolved from the precipitate.

The operation of the clarification process was hampered at times throughout its entire use, from 1904 to 1915, by its inability to remove color, and also due to the fact that the presence of high color prevented perfect coagulation and resulted in the production of an imperfectly clarified water. Since the completion of the filter plant, it has been possible to use aluminum sulphate for secondary coagulation and for color reduction. The clarification process was often hindered and sometimes rendered entirely inefficient because of high winds agitating the surface of the water as it entered the basins, breaking up the coagulation and preventing sedimentation. As there was no way in which a second treatment of the water could be applied, this imperfectly clarified water had to pass on into the distribution system.

Obtaining uniformly clear and pure water was also often seriously interfered with, because of the stirring up of the light and finely divided precipitate after it had settled to the bottom of the basins. Any marked change in the velocity of the flow through the basins, lifts up the light sediment and redistributes it through the water, making the final effluent turbid with finely divided matter in suspension that will not again readily settle out. Changes in the direction of currents in the basins, caused by differences of temperature between the incoming water and that in the basins, induces new directions of flow which disturb and move the surface deposits on the basin floors. In the autumn, as the air temperature falls, the sediment and water next to the bottom of the basins is sometimes one degree or more (Fahrenheit) warmer than the river water. This tends to change the course of the currents of the incoming water, deepening the flow and increasing the tendency to stir up the sediment. Under the most favorable conditions of operation, the effluent, while appearing very clear to the casual observer, contained small amounts of suspended iron compounds, also small particles of calcium and magnesium compounds, as well as some silt and silicious matter too fine to settle out during the comparatively rapid flow of the water through the settling basins.

A large portion of this material settled out in the distribution mains at points where the velocity was low, only to be flushed out through fire hydrants and house faucets at times of heavy draught. This caused numerous complaints of cloudy water from different quarters of the city, usually occurring after some local disturbance to the regular flow in the mains, such as would be produced by an unusual draught in extinguishing a considerable fire, or from the bursting of a large pipe.

All of the above objectionable features, together with many other difficulties, the department employes studied and endeavored to overcome, with more or less success, but they were finally forced to the conclusion that a satisfactory water could not be uniformly produced from the variable and erratic mixture flowing past our intakes, unless the final step of filtering through rapid sand filters be added to the process used and studied for more than ten years.

After the filter plant was built and placed in operation in May, 1915, there was nothing to complain of, as far as the consumer could judge, but there were occasions when the operating difficulties were greatly increased and the effluent was not all that the chemists and engineers desired. In January, 1916, a flood

of water carrying a large amount of extremely fine suspended matter came out of the Illinois river. On account of the heavy floating ice, water had to be taken through both intakes. The Mississippi water with its high color, mixing with the turbid flood from the Illinois, formed a combination of finely divided silt in suspension with organic coloring matter, which did not readily yield to treatment with lime and iron sulphate, so that the prepared water entering the filters had a turbidity as high as 98 p.p.m. representing the very finest of the suspended solids. Some of this fine material found its way through the filters

Throughout the following year (1917) no especial troubles were encountered, the attention of the working forces being especially directed towards greater economy of operation. Not until February, 1918, was there experienced any trouble similar to that just noted, when again the highly colored water of the Mississippi mixing with the muddy Illinois (both rivers being at high stages), made the water extremely hard to handle. After treatment with lime and iron sulphate the amount of aluminum sulphate required to give the necessary flocculation of the suspended matter ran as high as four grains per gallon. Even with this large use of aluminum sulphate the maximum color of the filtered water was 24 p.p.m. Since that time there has been nothing exceptional in the way of extreme conditions; the usual fluctuations in color, turbidity, alkalinity and dissolved solids occurring and recurring with the changes of the weather and seasons.

In the latter part of 1913 an apparatus for applying liquid chlorine to the clarified water was installed, with the idea that its use would not be commonly required, but would be available in emergencies and on occasions when presence of bacteria of the *B. Coli* group was suspected. Within a year, however, the application of chlorine became continuous and has so remained until the present time.

This somewhat hurried review of the history of water purification at St. Louis would not be by any means complete if mention were not made of the fact that St. Louis was foremost among American cities to investigate and propose filtration of its water supply. In 1865 the Board of Water Commissioners sent its chief engineer, Mr. James P. Kirkwood, to Europe to examine filters in use there and report on the feasibility of modifying those systems for purifying the Mississippi river water. A year later Mr. Kirkwood made a voluminous report recommending slow sand filters and outlining a design for their construction. The Board did not accept his recommendations and the scheme was abandoned, but from time to time afterwards dissatisfaction with the muddy water culminated in propositions of various kinds for improving its appearance, but little thought seems to have been given to its purity or lack of it.

After the opening of the Chicago Drainage Canal in 1900, the typhoid death rate per 100,000 gradually increased from 23 in 1899, to 47.09 in 1903. Early in 1904 the clarification process was inaugurated and although throughout the whole year the work was in the experimental stage and the results often uncertain and unsatisfactory, yet the typhoid death rate was reduced to 36.23 per 100,000, with a further reduction in 1905 to 18.97. After 1905 the rate never reached this figure again, but was steadily reduced during the succeeding years, reaching the comparatively low figure of 12.43 per 100,000 in 1914, the year preceding the opening of the filter plant. The value of this water treatment to the people of St. Louis, inefficient and unsatisfactory as it was, calculated from a health basis alone runs into figures that are staggering.

If conditions had remained the same it is likely that the typhoid rate of 1903

would have steadily increased, but assuming that it would have remained stationary after 1903, if the water supply had not been clarified, a total of 2536 deaths from typhoid were avoided during the 11 years that the treatment was in use prior to filtration. If the value to the community of the life of each individual be estimated at $3000, and if we assume that the cost of medicines, nurses' and doctors' services and funeral expenses in each fatal case would have been $250, and that the time lost from work in each case would have been six weeks; valued at $150, we will have a total sum of $3400 saved for each death avoided, or a grand total of $8,622,400 as representing the money value to the city of St. Louis of the lives saved through the partial purification of its water supply during 11 years.

It has been calculated from a careful examination of statistics that for every death from typhoid there were from three to four cases which did not terminate fatally. The reports for St. Louis of the number of cases for those 11 years show that out of 7120 cases 1245 deaths occurred; that is, a little more than one-sixth of the cases reported were fatal. To be conservative, let us assume that in avoiding 2536 deaths from typhoid, there were also avoided 7500 cases where the patients recovered. The actual expenditure avoided in each case for medicines, doctors and nurses, including the value of time lost from work, could not have been less than $250, which applied to the 7500 cases amounts of $1,875,000.

Adding this to the amount already calculated as the value of the lives saved, we have more than $10,000,000, or almost $1,000,000 for each year the purification process was in service, as the money value conservatively estimated from the health standpoint alone. The value to the community through being served with a clarified and softened water, *which permitted* the use of a diminished quantity of soap, which assured much greater convenience and economy for use in steam and hot water plants, which brought about the disuse of private filters and made the purchase of bottled table waters unnecessary, and which relieved the citizens of the necessity for apologizing to their visitors for the appearance of the water in the toilet and bath, can hardly be comprehended, much less calculated in cold figures.

The typhoid death rate dropped to 7 per 100,000 in 1915, the first year the filters were operated, rising in 1916 to 9.44; which increase was largely due to cases traced back to persons using water from impure wells and springs outside of St. Louis; in 1917 and 1918 the rate dropped to 7.5; which is, according to some authorities, about as low as could be expected for any large city.

In comparing typhoid statistics of different cities, the writer's attention has been called to a possibility that may tend to vitiate some of these returns; that is, in their zeal to make a good showing for their respective communities, some physicians and health officers record many typhoid cases as intestinal or diarrheal diseases, thus reducing the typhoid rate at the expense of the other disease rate.

A comparison of the published mortality statistics of 12 of the large cities, including St. Louis, seems to bear out this contention. On the deaths from typhoid as reported, St. Louis stands eighth in the list, but if the deaths from diarrheal diseases as reported be combined with those reported from typhoid, St. Louis comes among the first three cities. Again taking the annual death rate from all diseases, St. Louis shares honors with New York for third place.

While it is often said that statistics can be quoted to support almost any contention, it must be accepted as an incontestable fact that the purification of the water supply of St. Louis has added greatly to the healthfulness of the city and made it a more desirable place in which to live.

# PERSONAL HYGIENE*

ALISON HANAFORD,
*Mansfield, Mass.*

To keep children well and happy one must know about personal hygiene. Personal hygiene is the care of our bodies. One should stand erect so that the organs of the body will have plenty of room to do their work.

In walking one should throw the weight of the body forward onto the balls of the feet. The correct position of the foot is pointing straight ahead.

In carrying school books one should carry them under the right arm one day and under the left arm the next day, or divide the books and carry the same number under each arm.

When one reads, the light should shine over the left shoulder or from overhead. One should not read long without looking at some distant object in the room, to rest the muscles of the eye.

The teeth should be cleaned after each meal, to remove any particles of food that remain.

One should take a bath at least once a week in the winter and every day in the summer.

The bowels should move at least once a day, and if not, physic is needed.

Exercise is needed to keep the blood circulating; exercise also gives strength.

Home sanitation is the keeping clean and airing of a house. A house looking south or placed with its corners to the points of the compass has great hygienic value. One should always have plenty of fresh air in their rooms. Sunshine makes the rooms healthier and more cheerful. People living in dark rooms soon grow thin and pale. Oxygen is something in the air that sustains life. Without oxygen one could not live. Impure air is very bad for a person. It is caused by over-crowding, oil stoves, and gas stoves. Good ventilation is needed to keep the room healthful. The best way to ventilate a room is to open the windows both top and bottom.

Housewives should know where their drinking water comes from, and the pipes it goes through. Clear, sparkling water is not always pure.

The rooms should be well cared for, and the windows should be securely screened top and bottom. Screens should be put on before flies and mosquitoes are around and left on until they are gone.

Broken dishes and tin cans should be kept in separate barrels. The garbage should be taken away often.

The dish cloth and towels should be washed and hung in the sunshine after using, and not put away in a dark, warm place.

The hands should be washed before and after eating, after going to the toilet and before touching the baby.

The temperature of the baby's bath water should be between 98° and 100°. The baby's nose, ears, eyes and mouth should be kept clean, and a separate piece of cotton should be used for each nostril, eye and ear. If the baby's scalp is scaly, one should rub it with warm oil or vaseline. The baby's nails should be cleaned with a tooth pick every day, and should be cut often with small scissors. The baby should be dressed warm enough in winter and not too warm in summer. If a baby cannot have breast milk, cow's milk is the next best. The milk should be delivered in sealed bottles. Milk peddled in open cans should not be given to babies. Certified milk is examined by the state and found to be pure —and is the best for baby. If one is not sure the milk is pure, they can pasteurize it. This is done by heating the milk to 145° F. and letting it stay at that temperature for thirty minutes, then quickly cooled. The baby's milk should not be left on the steps, but put in the ice box.

I think there are quite a few things I could do to help save the babies from death, blindness and deafness. Many mothers do not know all they should about babies and they are not all foreigners. I wish that all mothers and girls could have the chance that some other girls and I have had.

*This is one of a group of essays written by pupils of the seventh grade in the public schools of Mansfield, Mass., following the regular instruction of the school system in Sanitation and Hygiene. It seems worth while to present it to show what is really done through public school work.

# IMPROVEMENT IN VACUUM METHOD OF FILLING CAPILLARY TUBES

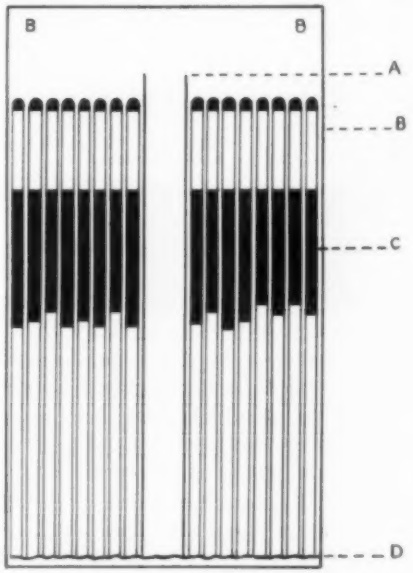
THOMAS A. WATSON,
*Bureau of Laboratories, Department of Health, New York City*

The vacuum method, being a government requirement, is now generally used for filling capillary tubes with vaccine virus. In this method the capillary tubes sealed at one end are placed with the sealed ends uppermost in a cylindrical container together with a glass tube $\frac{3}{16}$-inch in calibre and open at both ends. This large tube is placed in the center of the capillary tubes and is used for introducing the virus. (See illustration.) After the glassware has been sterilized the required amount (6.5 cc. of virus to 300 capillary tubes) is poured through the larger tube and the container placed in a vacuum apparatus. The air is carefully withdrawn until a vacuum of 18 inches is produced. By allowing the air to re-enter very slowly the virus rises to the desired position, usually slightly above the center, and is retained there.

Difficulty has been experienced from time to time in getting the desired amount of virus inside the maximum number of tubes, instead of outside of them, with a resulting loss of virus and labor. The trouble is, however, not constant. It has been traced finally to two factors; first, the difference in the finish of the ends of various batches of capillary tubes; second, the arrangement of the capillary tubes in the cylindrical container.

(1) Some batches of capillary tubes have the ends cut smoothly and evenly across, while others are more or less irregular. It is the smooth-cut ends which give rise to trouble by fitting too closely to the bottom of the glass container. This may be overcome by using a disc of wire gauze of No. 20 or No. 40 mesh in the lower part of the container to raise the ends of tubes from the bottom.

(2) In filling the container with capillary tubes it is advisable not to pack them tightly, for with tight packing the virus tends to rise between the tubes, possibly on account of capillary attraction.




*Cross section of cylindrical container with capillary tubes.*

*A - Filling Tube  B - Cylindrical Container*
*C - Virus  D - Wire Gauze.*

In the older method the loss by imperfect filling of the tubes was as high as 40 to 50 per cent; with the use of the improved method this loss is reduced to about 4 per cent.

# EDITORIAL SECTION

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## PAPERS FOR NEXT ANNUAL MEETING.

The American Public Health Association at the New Orleans meeting last October took into consideration the important matter of programs. In a conference of the officers of the sections tentative standards were formulated and these will be tried out at the California meeting, August 30-September 3, 1920.

One point which was brought out in the discussion is that the number of papers in all the programs should be limited. In past years, in an endeavor to present as many view points as possible as many as 12 to 14 papers have been presented at a single session. This is obviously a mistake, for the delegate who sits through a session so filled with papers leaves the hall fatigued and with confused impressions. For this reason it is recommended that hereafter the maximum of papers for any one session be 6 and that for most of the programs it be confined to three or four. It is quite possible that the limitation of papers will cause some measure of dissatisfaction among members whose papers can not be heard for want of space. While the Association is desirous of presenting opportunities for the expression of new information and fresh opinions regarding public health, it is felt that crowding the programs defeats the real purpose of the Annual Meeting. It is better for the delegate to carry away a number of clear conceptions related to his work than to go home tired and confused.

Important here are the discussions of the papers, and it is well known that they constitute a factor to the meeting that is quite as interesting and quite as important as the original papers. These discussions must usually be cut out when the sessions are crowded with announced papers.

It was further decided at the conference of section officers, that programs should be made up on a unified plan, and that a number of papers focused on a subject of vital interest should be presented in symposium form. When possible, speakers should be invited who can best furnish the information desired.

It is possible, of course, to drive such a method to an extreme, but this

must be avoided. There will always be excellent papers spontaneously offered. There are interesting speakers with good material who might not be thought of by the program committees. The plan of pre-arrangement would avoid including in the programs, papers that have no close relationships to the central theme. Such a method, however, should not be carried to the extreme. There will be, on that account, space reserved for papers offered spontanously, since they may be of importance.

Another matter which experience has shown as exceedingly important in connection with the annual meetings is the presentation of manuscripts to the section program committees. This should be done by the authors at least 30 days before the meetings and if possible, 45 days. Extemporaneous papers or those hastily prepared on the train *en route* for the meeting are usually not of high standard. The early presentation of the manuscript affords to the publication committees the chance to read all the papers and to prepare publication schedules to go into effect immediately after the meeting.

The presentation of manuscripts has another distinct advantage: the program becomes more stable and members are assured that the papers listed will be read. The speakers are pretty certain to be present and the audience will be spared the annoyance of coming to a meeting only to find that the announced speaker has neither come himself nor sent his paper. Those who attend the large meetings of associations know this to be a real difficulty with some programs. There is a bit of gossip that in one program of eight papers, not one of the speakers appeared. To avoid this difficulty there are a number of associations which absolutely refuse to publish names in the programs unless manuscripts are in the hands of the proper officials.

One further matter that is worthy the attention of those who propose to present papers before the A. P. H. A., is that of press abstracts. The author who sends to his program chairman well in advance of the meeting an abstract of his paper of from 150 to 200 words, has reasonable chances that his paper will be noted by the daily press of the country, an advantage that every one who has seen the recent campaigns for publicity during the war, should appreciate.

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## IS THERE HOPE FOR THE HEALTH OFFICER?

At the present moment the financial sky for most health officers is quite cloudy. The cost of living at the present time is 82% higher than it was in 1914. The income of the public health worker has been increased in no such ratio.

The situation, however, should not be considered hopeless. Competent statisticians predict that within the next few years there will be a marked decline in the cost of living. The existing high costs are due chiefly to two causes: the shortage of goods on account of the war and the increase in labor costs. Even if labor costs should not be greatly reduced, the supply of goods must before long catch up with the demand. History shows a constant alternation of undersupply and oversupply of commodities. During normal times the peaks of oversupply are four to five years apart, and the minima of supply show about the same periodicity.

Economic study of the periods succeeding each of the wars demonstrates a great scarcity of goods with extremely high prices during and immediately following the war. The earnings of manufacturers and distributors are increased

very largely, with the result that optimism rules and a boom of overproduction follows.

Presently the shelves of the dealers are filled and buying moderates. Active competition soon begins to reduce prices and, once on the downgrade, prices are inclined to tumble. Dealers hasten to dispose of stocks while they can still obtain fair prices. This process must continue until normal, and even subnormal prices are established.

In the meantime, the health worker will do well to sit tight. If, as a number of economists have asserted, we are to experience a financial flurry within the next few years, the man in the official position will have the advantage over the servant of industry. The latter in retrenching may have to cut deeply.

□

# In Memoriam

## HENRY B. BAKER

On Easter morning Henry B. Baker, physician, sanitarian and active administrator in public health passed to his long rest. By his death the list of past presidents of the American Public Health Association is diminished by a man never afraid to work, and never inactive in the face of duty.

Dr. Baker was born in Brattleboro, Vt., in 1837. He was of the number sent by his native state to fight in the War of the Rebellion, and served with the Army of the North from 1862 till the end of the strife. A few years later he took up the practice of medicine, for which he had been trained, and while thus occupied he became convinced of the value of sanitation and prevention. Established in the West, he was a leading spirit in 1870 in the introduction and support of a bill in the Michigan Legislature for the establishment of the State Board of Health. Three years later the bill was enacted and he was appointed Secretary of the new Board, a position which he held till 1905. At that time he removed from Lansing to his farm at Holland, Mich., which was his home till his death.

A member of the American Public Health Association from the second year of its existence he quickly became influential in its work. His name appears in the successive lists as member of the Advisory Council, of the Committee on Statistics and later on of the Committee for the Restriction and Prevention of Tuberculosis. He was elected President of the Association in 1899, serving till his successor Dr. Frederick Montizambert was installed the next year. In his presidential address at the Charleston meeting of the Association, Dr. Baker showed prophetic vision. He then discussed the causation of diseases and advocated prevention. He considered the causation of diphtheria, of yellow fever, and immunity through inoculation. In speaking of the quarantine by Government authorities, he dwelt on its value, but advocated its extension. "Something more than merely continuing the present methods of quarantine is needed," he said. "Diphtheria and scarlet fever should be excluded by quarantines; but the entire country is permeated with those diseases, and with the still more important one—consumption, and a Health Department of the Interior needed to be established at Washington." Today, twenty years later, the country has waked to the real necessity of what he then voiced, and the laws which have in view such a department are now before Congress.

President Baker's address foretold the practical application of sanitary science and emphasized the importance of state boards of health. These topics were a

measure of the man, and today what he advocated as a pioneer has in considerable part become the knowledge of intelligent people. His address of December, 1890, is a standard whereby to measure the strides forward of public health since that day.

In the past twenty years Dr. Baker has kept constantly at work spreading the gospels of prevention and health education, and his work has been sincere and without ostentation or the craving for public office.

## CONVENTIONS, CONFERENCES, MEETINGS

May 18-20, Parkersburg, W. Va., West Virginia State Medical Association.

May 19-20, Rockford, Ill., Illinois Medical Society, Public Health Section.

May 19-20, New Haven, Conn., Connecticut State Medical Society.

May 24-25, Washington, D. C., Conference Royal (English) Institute of Public Health.

May 24-25, Washington, D. C., State and Provincial Health Authorities of North America.

May 24-25, Charlotte, N. C., Southeastern Sanitary Association.

May 24-26, Omaha, Neb., Nebraska State Health Association.

May 24-26, Omaha, Neb., Nebraska State Medical Association.

May 25-26, Toronto, Ontario, Ontario Health Association.

May 25-27, Kalamazoo, Mich., Michigan State Health Officers' Association.

May 25-27, Kalamazoo, Mich., Michigan State Medical Society.

May 25-27, Columbus, O., Ohio Hospital Association.

May 26-27, Washington, D. C., Conference of last-named with Surgeon General, U. S. P. H. Service.

May 31-June 2, Highland Park, Ill., American Pediatric Society.

June —, New Orleans, La., American Association of Industrial Physicians and Surgeons.

June —, Duluth, Minn., Minnesota Hospital Association.

June —, Coeur d'Alene, Idaho State Medical Association.

June 1-3, Toledo, O., Ohio State Medical Association.

June 1-4, Cleveland, Ohio, American Medico-Physiological Association.

June 3, Providence, R. I., Rhode Island Medical Society.

June 3-5, Portland, Ore., Oregon State Medical Association.

June 8-9, Boston, Mass., Massachusetts Medical Society.

June 8-9, Eureka Springs, Ark., Arkansas Medical Society.

June 15-16, Minot, N. D., North Dakota State Medical Association.

June 21, Vancouver B. C., Canadian Public Health Association.

June 21, Vancouver, B. C., Canadian Medical Association.

June 21, Vancouver, B. C., Canadian Health Officers' Association.

June 21, Vancouver, B. C., Canadian National Tuberculosis Association, Vancouver, B. C.

June 21, Vancouver, B. C., Dominion Committee for Venereal Diseases.

June 21, Vancouver, B. C., Dominion Committee for Mental Hygiene.

June 21, Vancouver, B. C., British Columbia Hospital Association.

June 21-25, Montreal, Can., American Water Works Association.

June 23-25, St. Paul, Minn., Catholic Hospital Association.

July —, Regina, Sask., Saskatchewan Medical Association.

July 1, Antigonish, N. S., Association of Health Officers of Nova Scotia.

July 12-13, Helena, Mont., Montana State Health Officers' Association.

July 16-17, Seattle, Wash., Washington Health Officers' Association.

**September 13-17, San Francisco, Cal., American Public Health Association.**

# ASSOCIATION NEWS

## HEALTH EMPLOYMENT BUREAU.

**Help-wanted announcements will be carried free in this column until further notice. Copy goes to the printer on the fifteenth of each month. In answering keyed advertisements, please mail replies separately.**

**The Health Employment Bureau also sends lists of applicants to prospective employers without charge.**

Industrial physicians wanted. Salaries $2,500 to $3,000. State full particulars. Address 351, care of this Journal.

Bacteriologist and serologist for Cincinnati Health Department. Salary $2,000 to experienced man or woman. Work consists of bacteriological examination of diphtheria cultures, Widal test for typhoid, sputum analysis, preparation of antigen and amboceptor and Wasserman test, gold curve, urinalysis, examination of fæces, spinal fluid, pneumococcus determination, examination of brain tissues for Negri bodies, etc. Address Wm. H. Peters, M. D., Health Commissioner, City Hall, Cincinnati, Ohio.

Field director rural sanitation in southern state. Salary $2,700 to $2,600 with $800 expense allowance. Address 352, care of this Journal.

A large and successful civic agency in an city desires a physician especially interested in public health work on its staff for studies of administrative problems in coöperation with health department, health education work, etc. College education as well as degree of M. D. desirable but not essential; man or woman. Salary dependent on experience and qualifications. Write fully. Address 353, care of this Journal.

Chemist (Male) for Panama Canal. Must be a graduate in chemistry or sanitary engineering and have had satisfactory experience in water purification work. Must be an American citizen under 50 years of age and in good health. Entrance salary $181 month increased to $200 month after three months' satisfactory service. Free steamship transportation to Isthmus. For further particulars write Chief of Office, The Panama Canal, Washington, D. C.

Health Officer for Eastern city of 80,000. Salary $2,400 to $4,000 according to experience and ability. Give training, experiences and references. Address S. S. M. 354, care of this Journal.

A trained woman as assistant to Health Officer. City of 14,000. Must be able to inspect foods, bakeries, markets, stores, restaurants, hotels, etc.; also to place quarantine cards and to assist Health Officer generally. Address H. M. Wheeler, Grand Forks, North Dakota.

For Campaign News and the Lists of Proposed New Members, See Last Pages of Text at the End of the Notes Section

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## REPORT (FOURTH SUPPLEMENTARY) OF THE COMITTEE ON STANDARD METHODS FOR THE EXAMINATION OF THE AIR*

The Committee on Standard Methods for the Examination of Air was first appointed in 1907. It presented two preliminary progress reports, in 1909 (American Journal of Public Hygiene, XX, 346) and in 1912 (American Journal of Public Health, III, 78), and a final report in 1916 (American Journal of Public Health, VII, 54).

*Presented before Laboratory Section, American Public Health Association, at New Orleans, La., October 27, 1919.

It seems desirable at this time to review the progress that has been made in certain directions since the last report was presented.

### Review of Previous Recommendations

In its "final" report of October 27, 1916, the committee recommended the use of:

1. Continuous recording thermometers (supplemented when necessary by the use of accurate mercury thermometers without backs)

and of standard sling psychrometers for the study of temperature and humidity.

2. The katathermometer for the measurement of the rate of heat loss.

3. The Pitot tube and anemometer for the measurement of the rate of air flow.

4. The Palmer apparatus for the study of the dust content of the air.

5. A sand filter of the Ruehle type for the study of bacteria.

6. The Petterson-Palmquist or Haldane apparatus for the study of carbon dioxide.

All of the recommended procedures have been more or less continuously in use by members of the Committee and others, and so far as the Committee is aware have given reasonably satisfactory results. In regard to two points only, the use of the katathermometer for the measurement of heat loss and the determination of the dust content of air, is there anything material to be added to the 1916 report?

### USE OF THE KATATHERMOMETER AS A MEASURE OF THE RATE OF HEAT LOSS

Studies of the rate of heat loss by the use of the katathermometer have been made by Leonard Hill in England and by investigators working with the New York State Commission on Ventilation and the Division of Industrial Hygiene of the United States Public Health Service in this country. The instrument has in the main proved itself delicate and reliable, but the recent investigations have brought out certain points in regard to the interpretation of the results obtained which are deserving of comment.

The value of the katathermometer lies, of course, in the fact that it measures heat loss from a warm surface as determined by air movement as well as by atmospheric temperature and humidity. It does not necessarily follow, however, that the relative influence of air movement and air temperature on the exposed kata bulb will be the same as that upon the human body which is so largely protected by clothing. Investigations of the New York State Commission on ventilation, not yet published, indicate that the katathermometer reading which coincides with comfort is distinctly higher when there is much air movement than when the air is stagnant. In other words, the katathermometer responds more readily to air movement than does the clothed human body. The same point has been brought out in another unpublished series of investigations carried out in the Division of Industrial Hygiene of the U. S. Public Health Service, in which it appeared that a kathathermometer heat loss of approximately 5 millicalories per square centimeter per second coincided with comfort under stagnant atmospheric conditions indoors, whereas the value was nearer 6 when comfort was compared with katathermometer records in actively moving air. Similar differences have been brought out by Leonard Hill in his monograph the *Science of Ventilation and Open Air Treatment, Part I*, which has recently been published as *Special Report No. 32* of the Medical Research Committee of Great Britain.

Dr. Hill in chapter 2 of this monograph reviews results of LeFevre in regard to the rate of cooling of a pigling (whose body is practically unprotected) as compared with a scanty-haired monkey and a heavily fur-coated dog, and of the naked and clothed body of man, and compares the rate of cooling of the ordinary kata bulb and of a kata bulb protected by a cloth envelope. His figures and curves indicate clearly the greater relative effect of air movement upon the naked body and the unprotected kata bulb as compared with the clothed body or the fur-coated animal.

We desire to call attention to these facts because they introduce appreciable difficulties in the establishment of definite standards of heat loss, as measured by the katathermometer, which can be assumed to correspond with comfort. For indoor conditions with fairly stagnant air, however, heat loss from the dry kata corresponding to 5 millicalories per square centimeter per second may be assumed as reasonably satisfactory.

In view of the importance of humidity in determining human comfort we had hoped that results attained with the wet kata bulb might be particularly significant, and in the practical work conducted for the U. S. Public Health Service it was found that the wet kata even in uncomfortably warm air falls so rapidly that it is somewhat difficult to obtain significant results. When the results of the wet kata are expressed in millicalories the values are large and look impressive, but a variation between a heat loss of 12 millicalories and one of 17 on the wet kata in still air corresponds only to a time difference between 43 and 30 seconds,—a difference which local and temporary air currents might account for. We have found, however, as Hill sug-

gested in one of his earlier papers, that a heat loss of 20 millicalories on the wet kata is a limit that is not exceeded under comfortable conditions.

### DETERMINATION OF THE DUST CONTENT OF THE ATMOSPHERE BY THE HILL DUST COUNTER AND THE KOTZÉ KONIMETER

In the earlier reports of the Committee various methods of determining the dust content of air were reviewed and our investigations finally led us to the conclusion that the Palmer water spray apparatus would furnish the most satisfactory device for this purpose. Since our last report was published several new procedures have been suggested which deserve consideration at this time.

Graham Rogers and others have in the past made numerous attempts to collect dust particles suspended in the air by causing a current of air to impinge against a surface covered with glycerin or some other adhesive material. The earlier procedures of this kind proved unsatisfactory, but a device of this type has again been advocated by Dr. E. Vernon Hill of the Chicago Department of Health (*Heating and Ventilating Magazine*, June, 1917, p. 23). Dr. Vernon Hill's dust counter consists of an exhaust pump for producing the movement of the air and a small capsule or shield fixed at the end of the pump, carrying a cover glass covered with adhesive material for catching and retaining the dust. Dr. Hill has tested the accuracy of this apparatus by setting up six or more capsules in succession in series and causing the air to impinge upon one plate after another in succession. From this test he concludes that the first place takes out 62% of the dust present. It seems obvious, however, that the removal of a particle of a given size and weight by an apparatus of this kind will depend primarily upon the velocity with which the air current approaches the adhesive plate. Large and heavy particles will be thrown against the first plate. Small and light particles, whose momentum is so light that they are carried around the first plate, will be carried around any number of plates that may be placed in series, so that this method of controling results obtained is of little value. The actual counts obtained by Dr. Hill are so exceedingly low (from 500 to 1,500 per cubic foot in clean outdoor air, and from 10,000 to 30,000 in ordinary schoolroom air) as to make it reasonably clear that his apparatus collects only a fraction of the dust particles actually present.

The exceedingly significant investigations of the Miners' Phthisis Prevention Committee of South Africa (Pretoria 1919) have made it clear that it is precisely the small particles of dust which are most important from the standpoint of health, and the South African Committee criticises both Hill's dust counter and the Palmer water spray apparatus on the ground that they fail to reveal these small particles. So far as the Palmer water spray method is concerned this criticism appears to be based on a misconception, as it states that Palmer and his associates did not count any particles smaller than 10 microns in diameter, whereas the Palmer method includes all particles down to a visible size. The Hill dust counter, however, certainly fails to collect the fine particles which are of chief sanitary significance and seems to us of very limited value in ventilation investigations.

The South African Committee has, however, devised and used a dust sampling device described under the name of the Kotzé konimeter, which is based on exactly the same principle as the Hill dust counter but in which the nozzle through which the air passes is very small and the air being forced through this small opening by a piston rod moved with great rapidity by a brass spring. The velocity of the air impinging on the plate is sufficient to give a practically complete sample of even the minute particles of dust. The strength of the piston spring is sufficient to give a calculated velocity of air to the impinging nozzle of not less than 30 or more than 80 m. per second, and the slide for collecting the dust is coated with vaseline. This apparatus is described in detail in the final report of the South African Commission, and results obtained by the use of the instrument have been recently presented by Inness, *J. Chem. Met. Min. Soc.*, South Africa, 19, 132.

The Kotzé konimeter seems to be an admirable piece of apparatus for determining the number of dust particles in the air. If one must choose between the determination of weight and number, the number of particles, as the South African Committee points out, is undoubtedly the more important point; but the Palmer apparatus has the advantage of making it possible to determine both the number and the weight.

### DETERMINATION OF THE DUST CONTENT OF THE ATMOSPHERE BY ELECTROSTATIC PRECIPITATION

In our last report we called attention to some preliminary studies made by Dr. MacMillan of the New York City Department of Health on the precipitation of dust in air by the use of a high tension pole. A method of this kind has been extensively studied during the past two years by Dr. J. P. Bill in the laboratory of Preventive Medicine at Harvard Medical School, and Dr. Bill has very courteously furnished the Committee with the statement quoted below in regard to the comparative value of his apparatus and the Palmer water spray sampler. The dust in Dr. Bill's experiments was collected by drawing air by a motor at the rate of 273 cu. ft. per hour through a 12-inch length of aluminum tube 2½ inches in diameter. The dust was precipitated in this tube by a rectified alternating current of about 20,000 volts.

"Seventy-one tests, each of one hour's duration, were made with this apparatus and a Palmer water spray sampler in the various buildings and departments of a large plant rubber goods. The following determinations were made for each test:

"Relative and absolute humidity, barometric pressure, weight of total sediment in 50 cc. sample of 100 cc. aqueous suspension of particles collected in both machines, weight of organic and inorganic fractions of each 50 cc. sample, the weight of the aluminum collector before testing, with its accumulated dust charge, and with the dust portion still retained after rinsing out to make up a 100 cc. aqueous suspension. Counts were made on each suspension.

"The high tension weight figures were reduced to figures comparable with the rate of air passage through the Palmer machine (240 cubic feet per hour) by multiplying by the fraction 240/273. The resulting figures when compared with the weight figures of the Palmer and high tension suspensions, show, on a percentum basis, that the Palmer apparatus collected 59.9 per cent of total particles counted in the high tension suspensions, 63.3 per cent of the total sediment, 66.6 per cent organic portion, and 55.2 per cent inorganic portion collected by the electrical machine. Based on total sediments collected per 240 cubic feet of air in each process whose air was sampled, the Palmer collected 63.0 per cent of the amount retained by the electrical method.

"The conclusions are that the Palmer apparatus under similar conditions is 61.6 per cent as efficient as the electrical method (average of above figures). The electrical apparatus used is too bulky for ordinary field work, and suggestions are made for its simplification. It is felt that the findings warrant further study of the electrical precipitation method as applied to the sanitary analysis of air."

### CONCLUSIONS IN REGARD TO A STANDARD METHOD FOR THE DETERMINATION OF THE DUST CONTENT OF THE ATMOSPHERE

It seems evident to your committee that there are three distinct methods which may be used with reasonable success for the determination of the dust content of the air. Their special advantages and disadvantages appear to be as follows:

The Palmer water spray apparatus is fairly convenient and portable and permits the determination of the total weight of dust as well as the number of particles in a given sample. It yields, however, only about 60% of the total dust present in the air.

The Kotzé konimeter is even more convenient and portable than the Palmer water spray apparatus, but it is not possible by its use to determine the weight of dust as well as the number of particles present. Exact comparative data as to the proportion of dust obtained by these two methods are not at present available.

The Bill electrostatic method yields more accurate results than those obtained by the Palmer apparatus and could of course be used for determining counts as well as weights of dust. On the other hand the apparatus is not as yet in form sufficiently convenient for ordinary field work.

With all the facts in mind we are inclined to recommend that the Palmer water spray apparatus be retained for the present as the standard method for the determination of the dust content of air. It seems probable that the failure to collect all the dust actually found to be present by the electrostatic method will not seriously affect the relative values obtained in different environments. Recent studies of actual atmospheric conditions in industrial plants (Miller and Smyth, *Jour. A. M. A.* 70, 599; Winslow, Greenburg and An-

germyer, *Public Health Reports*, March 7, 1919; Winslow, Greenburg and Greenberg, *Public Health Reports*, May 30, 1919) have shown that the Palmer method yields clean cut and satisfactory results, high counts being obtained in shops which are dangerously dusty and low counts being uniformly obtainable by the application of recognized methods of dust removal.

If later studies should indicate that the Kotzé konimeter yields materially higher results than the Palmer water spray apparatus, or if the Bill electrostatic collector should be made portable and convenient for field work, one or the other of these two devices should be adopted; but for the present we believe it is wisest to retain the Palmer apparatus for ordinary sanitary use.

C.-E. A. WINSLOW, Chairman.
T. R. CROWDER
W. P. MASON
E. B. PHELPS
G. C. WHIPPLE.

# BOOKS AND REPORTS REVIEWED

**Pellagra.**—*H. F. Harris, M. D., New York: The Macmillian Company, 1919. Price $5.00. Pp. 421.*

The author's object in the preparation of this monograph was to make accessible to the English reader as complete a résumé as possible of the foreign literature on pellagra. In reviewing this literature it is amazing to note that such a considerable amount of study has been devoted to this disease. As to the theories of the causation of pellagra it is to be noted the studies in the past were not entirely limited to the maize hypothesis and that of the theories which have recently been put forward scarcely one is fundamentally new. Harris' view is that heredity is an important factor in the etiology of the disease. His conception of endemic pellagra is as follows:

Pellagra is an extremely chronic endemic affection common in tropical and subtropical countries, from habitual consumption of Indian corn, probably more directly the result of the action of certain phenol poisons produced by moulds while growing in this cereal and possibly of albuminous and ferment toxines contained in sound maize, all of which together acting from one generation to another and not unlikely intensified by bad hygienic conditions and insufficient and imperfect food, ultimately culminate in a frank outbreak of the classical symptoms of this disease. The malady is probably always hereditary.

Much space is devoted to consideration of the pathological anatomy and symptomatology of the disease. Harris groups the symptoms into three stages:

(1) Early stage—in which there is a progressive physiological deterioration of the entire body accompanied by dyspeptic nervous symptoms.

(2) An intermediate period in which the clinical features are more severe, there being recurring attacks and with intervals of fairly good health.

(3) A final stage in which one or more of the severer clinical phenomena persists throughout.

The matters of diagnosis prognosis and treatment are taken up in great detail. In the problem of prophylaxis the author's view is that in order to prevent the disease the consumption of maize must be greatly restricted and since the disease is hereditary we can not expect a complete cessation of the malady until at least one generation has passed following the institution of such measures. Some of the measures proposed are the cultivation of the best varieties of maize, development of proper methods of milling and the detection and rejection of spoiled maize.

This volume is complete in every detail in the consideration of a problem which is of such great moment to public health authorities, particularly in our Southern States.

D. GREENBERG.

# SAN FRANCISCO CITY AND COUNTY DEPARTMENT OF PUBLIC HEALTH

Members of the American Public Health Association who will attend in numbers the Annual Convention in San Francisco, Cal., September 13-17, 1920, will have an opportunity to become well acquainted with the Department of Health of the city and county, of which William C. Hassler, M. D., is Health Officer.

The Board of Health consists of seven members, three physicians and four laymen, appointed by the Mayor for a term of seven years each. Annually one member retires and is either re-appointed or a new member takes his place.

The Department of Health has the management and control of the City and County Hospital (San Francisco Hospital), Almshouses, (Relief Home for Aged and Infirm), ambulance service, municipal hospitals and receiving hospitals. The latter three are embodied in what is known as the Emergency Hospital Service, which consists of five emergency stations located in parts of the city where the same will serve the greatest number of people. Four of these hospitals are equipped to give first-aid and have a personnel of 3 physicians, 3 hospital stewards and 3 ambulance drivers. Connected with the hospital is an ambulance that serves the district outlined for the particular hospital. One Central Emergency Hospital is maintained, which cares for all cases that require detention or restraint, and is also equipped to do any major surgery that may be brought there from one or the other ambulance stations when the case requires special attention.

The Health Department is charged with the duty of the preservation, promotion and protection of the life and health of the inhabitants of the city and county, determines the nature and character of nuisances and provides for their abatement. It has sanitary supervision of the municipal institutions of the city and county other than those named above, including jails, schoolhouses and public buildings; of the disposition of the dead; of the disposition of garbage, offal and other offensive substance. It has the control and disposition of all expenditures necessary in the institutions under its immediate control and annually fixes the salaries and duties of all appointees of the Department.

It maintains a Social Service Department with two city physicians attached thereto, whose duties are to investigate and treat any cases of sickness reported when the persons are unable to afford private physicians or private hospital treatment. Through this Department all indigents, and others requiring hospital treatment and unable to pay for same are admitted to the San Francisco Hospital or the Relief Home.

The Executive Officer of the Department is the Health Officer who has general supervision over all institutions under the direction of the Board of Health. In addition he has supervision over the following bureaus and divisions:

Bureau of Sanitation and Laboratories. In this Bureau there is a plumbing division with five inspectors who have charge of the installation of all plumbing in new buildings and all alterations made in old structures.

Division of Epidemiology which deals with communicable diseases and the abatement of nuisances.

Division of Child Hygiene which licenses foster-homes for children and has supervision of the health centers.

Division of factory and work shop inspection, disinfection, tenement house inspection, and market inspection, which supervises the anti-mortem and post-mortem inspection of all animals killed for food in the city and county of San Francisco. The force is composed of five veterinarians and ten lay market inspectors.

Division of Food, Milk and Dairy Inspection.

Division of School Health Inspection, consisting of 11 nurses, 3 physicians and one chief inspector.

The annual appropriation to the Health Department for the fiscal year 1919-20 for the maintenance of the institutions, laboratories and inspection divisions under its care and control amounted to $1,268,000.

**Anent the San Francisco Meeting, September 13-17, 1920. Note the Revised Date. How about going on the A. P. H. A. Special Train? See last text pages of this Issue for Itinerary.**

# SAN FRANCISCO HOSPITAL

The JOURNAL is fortunate in being able to present a picture of the San Francisco Hospital of which the Department of Health has the management. The original hospital was erected in 1872, and as larger quarters became necessary, additional buildings were added until there were in all some 16 structures in the group.

In 1908, following a special election for authority to incur the indebtedness, a bond issue of $2,000,000, the construction of the new hospital was begun. It was evident later that the sum voted would not be sufficient, so that in 1917, the main group of buildings having been declared ready for occupancy in 1915, a further sum of $1,500,000 was voted for the hospital.

The general hospital, the ward wings of which are shown in the illustration, has a capacity of 512 beds with the possibility of a maximum of 752 if needed. The wards run east and west and are connected to a wide corridor which extends the length of the site and unites all the structures. The wards are 110 ft. by 26 ft., 26 beds each, with two separation wards of two beds each, the allowance of air space being 1500 square feet for each patient. In the administration end of each ward there is a diet kitchen with dining room attached, a laboratory, a dressing room where minor operations may be performed, utility rooms and a large solarium. An elevator large enough to take a bed with four attendants is in operation in each ward building. Administration, receiving building, nurses' home, communicable diseases and the necessary power plant, laundry, etc., are provided for in commodious and convenient quarters, while the tuberculosis group is an adjacent unit of several buildings, connected with the same long corridor. The accommodations here are for 250 patients. The wards are so liberally provided with windows that it is possible to make of any one of them an open ward.

One feature that might be specially dwelt upon in connection with the conduct of the San Francisco Hospital is that this institution has a training school for nurses, the number at present being about 120, and has a capacity for training about 144 nurses. The medical and surgical staffs for the treatment of patients are recommended by the faculties of the University of California and Stanford University Medical Schools and appointed by the Board of Health.

In connection with the acute Tuberculosis Hospital in the San Francisco Hospital group, the city is now negotiating for the purchase of a country sanatorium which will care for 100 adult cases and connected with this institution will be a place for the care of approximately 50 children.

# PUBLIC HEALTH NOTES

Abstracts by D. Greenberg, M. P. Horwood and Mayo Tolman.

**Artificial Tuberculosis Infection Through Respiratory Route.**—In an experimental study on the artificial tuberculosis infection of guinea pigs through the respiratory route, in which by way of the mouth was excluded, the author found: That a single spraying of five minutes with a suspension of tuberculous sputum, produced pulmonary tuberculosis in 100 per cent of guinea pigs when they were exposed to the spray. The tubercles became visible in the lungs microscopically on the 7th day, at which time the tracheobronchial glands showed distinct involvement. After the 18th day tubercles were frequently found in the liver and spleen. Microscopically, after 24 hours, localized interstitial cellular infiltrations were found and after 48 hours the infiltrations became generalized. On the 11th day, large consolidated areas were present. Inoculation experiments showed that when guinea pigs were kept in a spray of tuberculous sputum for five minutes, tubercle bacilli were present in the lungs 15 minutes later. In order to eliminate the possibility of the microörganisms having been absorbed from the nasal mucous membrane, the following parallel experiment was made on the same day. Twelve adult male guinea pigs were selected, and the same sputum used in the above spraying experiment, but undiluted, was placed inside their noses with a small wooden applicator and the pigs kept in a separate group. They were etherized and examined 18 days later with the following results: A single tubercle was found in the lungs of one pig; in the remaining 11 the lungs were entirely free. The cervical glands were involved in every pig. The spleen showed involvement in 5, the liver in 2 and the mesenteric glands in 5.—J. B. Rogers, *Am. Rev. of Tuber*, February, 1920, 750. (*D. G.*)

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**Maternal Mortality.**—The records of life insurance companies show that for all women under 45 years of age who are insured, the diseases of pregnancy and the puerperal state are the second greatest cause of death. It is believed that a considerable percentage of these deaths from childbirth were recorded on the death certificates as being due to tuberculosis, heart disease, etc., and that the applicant for insurance remembered the associated childbirth and not the cause of death given in the death certificate. Our present mortality records do not show the frequency with which childbirth is a contributing cause of death. The present maternal mortality may be greatly reduced by application of our present obstetric knowledge. Systematic education similar to that used in combating tuberculosis is needed. Increased hospital facilities and nursing service must be provided. The state should furnish assistance in giving poor women the proper care during pregnancy, labor and puerperium. For the present, more hospital beds may be made available by sending women home by ambulance early in the puerperium and caring for them through an out-patient nursing service.—C. H. Davis, *Jour. A. M. A.*, Feb. 21, 1920. (*D. G.*)

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**The Eye a Channel of Infection in Respiratory Diseases.**—Only recently has it been demonstrated that the eye might be an important channel of infection in respiratory diseases. Maxcy (Jour. A. M. A., Mar. 1, 1919) showed that *B. prodigiosus* introduced into the conjunctival sac can be recovered from the nose in five minutes, from the throat in 15 minutes, and from the stools in 24 hours. Corper and Enright have attempted to corroborate and elaborate on these experiments. The experiments were carried out on tuberculous patients, capable of expectorating sputum. The time factor after instillation, the course followed, the distribution after indigestion were all tested, *B. prodigiosus* being used, and the authors conclude that the eye must be considered as one of the most important portals of respiratory infection. Although the greater part of infectious material entering the eye was subsequently swallowed and taken into the gastro-intestinal tract they found that a small, but definite portion reaches the larynx and trachea, where it may persist as long as a week. In passing from the eyes it traverses a definite channel, according to the eye it has entered. Infectious material that has been ingested is far less liable to reach the respiratory tract than that entering by way of the eye or nose.—H. J. Corper and J. J. Enright, *Jour. A. M. A.*, Feb. 21, 1920. (*D. G.*)

**Feeding Brazilian Babies.**—From the report of the activities of the Instituto de Puericultra at Buenos Aires, Brazil, it appears that the only women who profit by Well Baby Clinics are those who get artificial food there for their children. Mothers who nurse their own children soon tire of bringing their babies merely to be told that they have increased so much in weight. Thus a premium is put on artificial feeding. It has been suggested that small monthly prizes be given to those mothers whose babies show the greatest progress, the woman's pride in being recognized as a model mother being a greater stimulus than the prize itself, and the amount given does not have to be large.

This station is now supplying breast milk in bottles. At the present time it is furnished only for in-patients, but it is expected that the practice of furnishing the milk can be extended so that it may be given out for use in the home. It is claimed that an infant thrives as well on bottled breast milk as it does when fed at the breast.—(*M. T.*)

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**War Emergency Lessens Infant Death Rate.**—A report from workers in France reveals an interesting situation at Lille during the German occupation. The cows were all carried off and no milk was available, and as factories were not running, the women could not find wage-earning work, and had to stay at home. The consequence was that women were driven to nursing their infants and that the infants had their mothers with them at home, resulting in an infantile death rate that was far lower than had ever been known before in the town.—(*M. T.*)

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A report on the physical condition of men of military age by the National Service Medical Boards in the period from 1917-1918 contains valuable statistical data. The number of medical examinations of men of military age made during the period under review was 2,425,184. This figure does not, however, represent the actual number of men examined, as it includes re-examination. Those examined were classed in four grades, as follows:

Grade I.—Those who had attained the full normal standard of health and strength and were adjudged capable of enduring physical exertion suitable to their age.

Grade II.—Those judged capable only of undergoing such physical exertion as does not involve severe strain.

Grade III.—Those presenting marked disabilities, or such evidences of past disease that they were not considered fit to undergo the physical exertion required for the higher grades.

Grade IV.—Those totally and permanently unfit for any form of military service.

The result of the examinations was as follows:

| | Number | Percentage |
|---|---|---|
| Grade I | 871,769 | 36.00 |
| Grade II | 546,276 | 22.23 |
| Grade III | 756,859 | 31.32 |
| Grade IV | 250,280 | 10.00 |

Medical examination thus showed that of every nine men of military age in Great Britain, on the average three were perfectly fit and healthy; two were upon a definitely infirm plane of health and strength, whether from some disability or some failure in development; three were incapable of undergoing more than a very moderate degree of physical exertion and could almost (in view of their age) be described with justice as physical wrecks; and the remaining man was a chronic invalid with a precarious hold upon life.

An analysis of medical examinations of different groups of men between 18 and 25 in Yorkshire, made with a view to revealing the influence of occupation upon health, gave the following remarkable results:

| Occupations. | Percentages Grade I. | Grade II. | Grade III. | Grade IV. |
|---|---|---|---|---|
| Agriculturists | 71.9 | 15.5 | 8.8 | 3.8 |
| Miners | 68.9 | 15.1 | 10.5 | 5.5 |
| Agriculturists | 62.0 | 23.0 | 11.6 | 3.4 |
| Engineers | 60.9 | 23.9 | 13.4 | 1.8 |
| Iron and steel workers | 60.2 | 25.6 | 11.2 | 3.0 |
| Lace workers | 45.0 | 26.9 | 22.7 | 5.4 |
| Woollen trade | 54.6 | 10.9 | 24.0 | 10.5 |
| Woollen trade | 37.5 | 31.7 | 27.0 | 3.8 |
| Tailors | 33.9 | 21.4 | 33.5 | 11.2 |

—*Medical Officer*, Mar. 13, 1920, 106. (*D. G.*)

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**Salaries of Assistant Medical Officers.**—The recommendations made at different times by the British Medical Association with regard to the salaries of medical men employed by health authorities have contained, with their excellent intentions, more than one anomaly.

This has embarrassed alike authorities in offering conditions of remuneration, candidates in applying for vacancies, and medical journals in accepting advertisements. In respect to the last, we have decided not to accept advertisements in these columns for the future where the pay offered for assistant medical officers is less than £500 per annum or its equivalent.—*Lancet*, March 13, 1920. (*H. N. C.*)

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**Death of Founder of Ministry of Health in England.**—The *London Times* of March 15, 1920, announced the death from pneumonia of Sir Robert Morant. Sir Robert was permanent secretary to the Minister of Health, late chairman of the National Health Insurance Commission and formerly permanent secretary to the Board of Education. For years before any official action was taken, he worked toward his great object, a Ministry of Health. On many occasions, just when hope that the ministry would be established and seemed brightest, some obstacle supervened and the scheme was dropped. Morant never waivered and never despaired. At last his patience prevailed and the Prime Minister was won over to the plan. Although not a medical man at all, he was frequently referred to in Great Britain as "the biggest medical man of his time," according to the *Times*.—(*J. A. T.*)

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**Deratisation by Chloropicrin.**—The possibilities of using chloropicrin as a deratisation agent are set forth in a paper presented before the Paris Academy of Sciences by M. Roux. Bertrand and Brocq-Rousseu claim that rats and their parasites are very sensitive to the action of the fumes of this substance. These are without effect on fabrics or colors.—*Revue Scientific*, February 28, 1920. (*H. N. C.*)

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**Dangers to Child Bearing.**—In its *Statistical Bulletin* for March the Metropolitan Life Insurance Company furnishes some figures in this very important matter, which bear significant value to the health officer who has here a means of prevention, if his community will support him in his endeavors.

An inquiry sent out recently by this company to health officers of all the states and larger cities having good birth registration has resulted in the following information for the year 1919:

1. More than five women die from disorders of pregnancy or childbirth out of each 1,000 births registered. This is equivalent to one maternal death out of every 185 confinements.

2. Forty-five babies out of every 1,000 total births, or one out of every 22, are born dead.

3. Forty babies out of every 1,000 born alive die before they are one month old.

Such are the dangers to mother and infant at the present time.

As against the above figures are the following which prevail among women who receive prenatal and maternity care under skilled direction:

1. Only *two* women instead of *five* die out of every 1,000 confinements.

2. Only *twelve* babies instead of *forty-five* are still-born in every 1,000 births.

3. Only *ten* babies instead of *forty* per 1,000 born alive die under one month of age.

Results such as these have been achieved in Boston, in New York City and elsewhere. They can be obtained anywhere if adequate nursing and medical care are available to women during pregnancy, at confinement and during the first month of the infant's life. Such is the great promise in life conservation held out by prenatal and maternity care for women.

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**First Chinese Medical College.**—During the war between Japan and Russia in 1904 the Chinese Red Cross was formed to look after thousands of Chinese who were left homeless and destitute in the regions where fighting raged for many months. After the situation was relieved, a considerable sum of money remained over, and upon decision of members of the General Council, ground was purchased near Shanghai and a building erected as the Chinese Central Red Cross Hospital and Medical College for Chinese students. The hospital is completely equipped with the most modern apparatus and furnishings. Instruction in the college is in English only, under the direction of S. M. Cox, M. D. The first year there were twenty registrants. Each received his degree as a competent practitioner.

The Chinese Red Cross is today an organization with 25,000 members, whose interest in world relief work is evidenced by the entrance of the society into the League of Red Cross Societies. The Chinese have been much impressed with the work of the American Red Cross both during and after the war, and China now desires to take her place beside the other nations of the world in the work of relieving human suffering.

**Review of the Milk Problem.**—In the issue for March 24, 1920, *Municipal Reference Library Notes* brings together world-wide studies on milk, which is worthy the attention of public health officers. An abstract of it is here presented.

The Milk and Dairies Act of Great Britain, which was passed before the outbreak of the war, but has never become operative, is to have a bill of amendment to it introduced soon, according to an editorial in *The Municipal Journal* (London), Feb. 13, 1920. It is expected that the bill will include (1) the licensing of milk traders; (2) powers to grade and define milk; and (3) power to local authorities if they so desire to distribute or to supervise to a greater extent than now the distribution of milk.

The committee on the production and distribution of milk, of which the Hon. Waldorf Astor, M. P., is chairman, has been studying the milk problem for some years. The committee has issued three interim reports, the first in June, 1917, and the third in November, 1918, and its final report in 1919. The amending bill is to be based on the recommendations of these reports.

Of particular interest is the scheme for the control of milk distribution. This includes dividing the country into suitable areas for distribution, a milk superintendent for each area, a national milk clearing house to control the wholesale milk trade, the government to obtain option to purchase the business of wholesale traders with a view to the State becoming the sole wholesaler of milk, producers to be encouraged to form themselves into cooperative associations and every means utilized to produce clean and wholesome milk.

The Ministry of Food has also prepared several memorandums on milk control and the milk supply, and a "Report on action taken towards the control and distribution of milk" in which "is described the action which has been taken by the Ministry up to 31st January, 1919, to initiate control of the wholesale trade in milk and to ensure a more effective distribution of supplies throughout the trade and to the public."

In the interesting *Report of the Medical Officer of Health* (1918. 100 p. 614.09G7b) of the city of Birmingham, England, reference is made to this subject in these words: "There is abundant evidence in peace time, and even more in war time, that the use of milk by the artisan classes is far too limited. The large staff of women workers employed by the Public Health Committee, who are in intimate contact with the feeding conditions of the children of Birmingham, all tell the same story, viz., that the supply to the toddlers and other children is most inadequate, and that this is due to a want of appreciation of the value of milk and in a few cases to inability to pay for a supply. Leaflets are distributed on various subjects dealing with the need of milk for children."

Several states in this country have realized the need of education. Massachusetts, through its State Department of Agriculture, Dairy Division, and the Boston Milk Campaign, has recently carried on an extensive educational campaign. The organization consists of milk producers, dealers and the civic bodies, while the executive committee is composed of three members from each class. The funds are provided by the producers, who pay on the basis of 15 cents for each $100 worth of milk sold to the dealer, and the dealer matched this amount. The general scheme of publicity is carried out by exhibits and posters, with a staff of six experts who spread the doctrine of the healthfulness of dairy products in the schools and industrial plants of Boston.

California, through the help of the Dairy Council of the State Board of Health, conducted a school survey in the state and found in the larger cities that from 40 to 48 per cent of the school children were not drinking any milk. These figures "indicate the extensive field for educational advertising on the part of an industry that is suffering because of false economy on the part of consumers—an economy that is aggravated by ignorance of the true facts."

The Oklahoma Public Health Surveys publish in the volume on Oklahoma City a story of the milk supply of the city, which contains a study of the conditions of supply and delivery, bacterial content and butter fat content, and physical condition of persons handling the milk.

Toledo has been studying its milk problem for some months and various reports have been printed in the Toledo City Journal; the most recent is that of February 21st, which is an exposition of the bacterial content of the milk, showing that the present conditions are a menace to the community, and that there is need for a new milk ordinance.

New York state and city have been strug-

gling with their milk problems also. The Fair Price Milk Committee for the city of New York has recently issued a report. In the last three years the following efforts have been made by the city to bring milk within the reach of the poor: Mayor's Committee on Milk, by the county through the district attorney's office, an inquiry before Judge McAdoo, through the Wicks committee, the Reconstruction Commission, the Glynn-Finley Commission and the Battle Commission of the state, and lastly this Fair Price Milk Committee of which Dr. R. S. Copeland is chairman. The committee concludes "that the creation of a State Commission is essential, in order that all concerned may be treated fairly, and particularly that the public may have assurance that it is being rightly dealt with as regards the most vital of its foodstuffs." Definite and detailed recommendations are made by the committee.

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**The Bolshevik as a Health Officer.**—The *Review of the International Red Cross* publishes in its issue of October, 1919, extract of a document originating from the Commission of Public Health of the Russian Soviet government. This document outlines and recounts some of the work and gives the organization of the commission. The Soviet government is organized with commissions similar to our executive departments. The head of each commission enjoys the rank and privilege of a minister. All sanitary and medical work of the republic is in charge of the Commission of Public Health.

This commission is composed of fourteen sections as follows: Medical, sanitary and epidemiological, balneology, maternity and child welfare, general material and supplies, medical material, pharmacy, military medicine, naval medicine,, railway medicine, medicine for waterways, finance, general administration, and elementary instruction in hygiene. It is interesting to note that a special section is devoted to the subject of baths. In the provinces there are apparently local medico-sanitary commissions which concentrate in themselves the sections on medicine, sanitation and epidemiology, supplies, etc. These local commissions have also taken over the work of the old federal, departmental and municipal departments of medicine.

The document states that the general death rate in Russia in 1914 was 26.7 per thousand, whereas in the rest of Europe it varied from 14 to 17 per thousand and that in that year the Russian birth rate was 43.7.

During the organization of the Commission the country was being ravaged by epidemics. As an example of its accomplishment, the Commission mentions that in 1908 the cholera epidemic claimed more than 200,000 victims, while a similar epidemic produced from September to April, 1918, only 35,619 cases. The preventive measures adopted by the Commission were principally prophylactic injections, hospitalization and chlorination of water. In the influenza epidemic of 1918 the Commission cites 700,000 cases. (Craig and Dublin estimate for this epidemic 6,000,000 deaths in India, 400,000 deaths in Italy and from 450,000 to 600,000 deaths in America.) In Russia "special missions were organized to study influenza and they obtained very interesting results on the nature and character of this malady." The typhus epidemic starting in the fall of 1918 and reaching its height in the spring of 1919 apparently occupied more of the Commission's attention than did either of the other epidemics. In eight months (November to July) it reports 1,299,262 cases with a mortality of 6.8 per cent. The Commission endeavored to interest the people themselves in an attack on this disease. Local committees were appointed and given the necessary rights and powers. 9,000 hospital beds were established in Moscow and 10,000 elsewhere. Public baths, washhouses and disinfection chambers were installed for the free use of the people. In all 200,000,000 roubles were expended in this work. Research was undertaken and the work of Professor Marzinovsky is quoted in which he claims to have recognized the cause of typhus in a certain protozoa. Smallpox, for which there are reported 81,861 cases from November 1, 1918, to July 1, 1919, also occupied its attention. By a decree of the Council of Kommissars (in which is vested supreme authority) vaccination was made compulsory for the first time in this country. To carry this out, steps were taken to increase the production of vaccine, which was distributed free to the people.

The Commission also takes credit for introducing other reforms. It fixed the obligation (upon whom, it does not state) for reporting infectious diseases. It instituted government inspection of vaccines and sera and by degrees gave to institutes and laboratories preparing these priority for supplies of food, forage, etc.

By decree also, all medical service of the country passes into the hands of the state and pharmacies have been nationalized. Again by decree the sanitary inspection of dwellings and lodgings was provided for and it is necessary for all such inspectors to first take courses in the subject. In Moscow a model laboratory is in operation showing the purification of water. One section of the Commission is occupied with the medical inspection of school children and infants. This has provided assistance for abnormal children, instituted school gardens and arranged summer colonies for city children. The nourishment of all school children is incumbent upon the state.

In educational work the Commission on Public Health claims that it has been particularly active. Besides establishing courses dealing with disinfection, tuberculosis and other subjects and printing "several million" pamphlets on medicine and hygiene there have been held special conferences on various epidemics and general congresses on bacteriology, epidemiology, sanitation, pharmacy, dentistry, school hygiene, military medicine and other subjects. In Moscow a museum of social hygiene has been established, an exposition dealing with epidemics and infectious diseases has been set up and workshops maintained for making exhibit material. In Moscow also a large number of buildings have been set aside for the use of an Institute of Public Health. This institute is to be the highest scientific authority on hygiene, bacteriology and epidemiology.—*Homer N. Calver.*

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**Advice to Miners Valuable to Others.**—Physical examinations at regular intervals is advocated for miners by the Bureau of Mines, Department of the Interior, and it adds that if this applies to miners it ought to be proper for every person.

"Every miner and his family should keep in the best possible physical condition," declares the bureau. "A good miner always takes care to keep his working tools in excellent shape, in order that he may do effective work. He also carefully observes the danger signs that are seen at various places.

In order to keep in good physical condition, every person should undergo a thorough physical examination at least once every year, better still, once every six months. This applies not only to the miner but to every member of his family as well. These periodical physical examinations should be made even if the person is apparently in good health.

Many diseases begin without sufficient symptoms to attract attention. Tuberculosis, Bright's disease, and some diseases of the heart may progress for some time before the victim is aware of it. Thorough physical examination at regular intervals is the best means of detecting diseased conditions. Early knowledge of a disease coming on enables the person affected to take the proper steps in the correction of diet, habits or occupation to arrest the progress of the disease.

Complete periodic physical examinations are important for every person.

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**A Federal Department of Public Health** for Brazil has been created by the law approved by President Pessoa January 20. Under the supervision of the department will be a Board of Health for Rio de Janiero, a board of rural sanitation and a board of maritime and fluvial prophylaxis. Besides these there will be sections dealing with sanitary statistics; sanitary engineering; the supervision of drains; the prevention of leprosy and venereal diseases; the supervision of the practice of medicine, pharmacy, dentistry and obstetrics and hospitals for contagious diseases and child welfare. The federal government also takes charge of meat and food inspection. Under the law a supreme council of hygiene and public health is appointed. Part of the expenses of the administration of the law will be met by taxes on alcoholic drinks, gambling houses, clubs and casinos at health resorts, sera, vaccines and drugs.—*Jour. A. M. A.*, Feb. 21, 1920. (*H. N. C.*)

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**Red Cross of Seven Nations Fighting Typhus.**—With the response of the Red Cross societies of Belgium and Sweden to the appeal of Poland for aid in her anti-typhus fight, the number of Red Cross societies participating in the war on the disease is increased to 7: United States, Spain, Rumania, Portugal, France, Sweden and Belgium.

The report of the medical mission sent by the League of Red Cross Societies to investigate typhus conditions in Poland, dwelt on the inexpediency of isolated action in dealing with the disease, and recommended concerted action. Individual nations are therefore assisting the League in the effort to coördinate the relief activities and thus render them more effective.

**Present Foreign Operations of American Red Cross.**—The American Red Cross continues to carry on relief work in various European countries, and much of it is concerned with public health. The work of certain European commissions has been brought to a close in Switzerland and in Czecho-Slovakia, for example. In others, as in England, Italy, Greece and Roumania, the personnel has been withdrawn except for the few representatives necessary to wind up affairs and place upon a permanent local basis certain activities.

The conditions still existing in Serbia, Montenegro and Albania are of such a nature as to require the continuation of actual relief operations; but these are being turned, as rapidly as possible, into a constructive health program of such a character that it can be carried on to a major degree, at any rate, by the respective peoples themselves.

The country which, at the present time, is receiving the greatest proportion of the available resources of the Commission for Europe is Poland, where not only the appalling ravages of typhus and other epidemic diseases (during the last twelve months, 160,000 cases of typhus have been reported in Congress Poland, and 75,000 in Galicia), but the rigors of an unusually severe winter and the failure, in large part of last summer's harvest, combine to bring about conditions of extraordinary distress. The ravages of war had left this people without the resources for self help which have been developed in the sister republic of Czecho-Slovakia.

Under the Commissioner for Europe there are now two active Russian units, one in South Russia, where relief has been extended as far north and went as Denekin's lines have penetrated, and where additional supplies will be distributed as opportunity offers; the other in the Baltic States and that part of Western Russia not under soviet control. Here operations are rendered extraordinarily difficult by the complexity of the political situation, but the Red Cross unit has made a wonderful record of courage, energy and initiative in carrying on relief and sanitary work in Finland, Latavia, Esthonia and Lithuania and is so organized that, when opportunity comes, it can render immediate and effective aid in Petrograd and other parts of soviet Russia.

The health conditions in this part of the world, already deplorable, are rapidly growing worse, but the Red Cross is doing its share in righting them and national headquarters at Washington is now engaged in recruiting an additional unit of forty doctors in response to a cable just received.

During the first year of its work, the Commission established fourteen hospitals for sick and wounded Czech and Russian soldiers and sent eighteen heavily loaded relief trains from Vladivostok to Western Siberia. In its anti-typhus campaign the American Red Cross equipped and maintained an anti-typhus train which shuttled back and forth along the line of the Trans-Siberian railway, playing a leading part in the fight against the spread of the scourge.

In Paris is the headquarters of the Jardin des Enfants, which is the Red Cross organization having particularly to do with the care of French children. Among its most useful activities is the moving of thousands of city children, suffering from malnutrition and lack of fresh air and sunshine for long vacations in the French countryside.

In France, as elsewhere in Europe, the Red Cross does not hesitate to give material relief where this is the thing most needed, but, wherever possible, emphasis is placed on the constructive medical program and particularly upon the care of mothers and children. There is the greatest need, owing to the primitive housing conditions, for small maternity hospitals.

Political conditions in the Balkans are still unsettled, and, as a result, the leadership and coöperation of the American Red Cross is peculiarly welcome, particularly in the field of public health, and the personal relations between the authorities and the Red Cross personnel are cordial to an unusual degree. The trust and affection of the common people is so intense as to be almost embarrassing. Even the Mohammedan Slavs, who have been isolated by their religion from the rest of Europe for centuries, recognize the disinterestedness of the American Red Cross, and welcome the women doctors and nurses into their homes, learning from them the much-needed gospel of cleanliness and fresh air.—The Red Cross Bulletin, February 16, 1920.—(*J. A. T.*)

## STATE HEALTH NOTES—LEGISLATION

**Massachusetts.**—The Senate of the State has accepted the adverse report made by its Committee on Public Health on the bill presented by the Medical Liberty League which sought to provide for the abolition of compulsory vaccination.

By a unanimous vote the Joint Committee on Social Welfare and Public Health of the Massachusetts Legislature has reported a new draft of the bill of Edna Lawrence Spencer providing for a system of maternity benefits. (The different bills are outlined in the JOURNAL for April, 1920, page 379). The bill reported provides for prenatal care, but not postnatal. It carries also a system of cash benefits somewhat different from that originally proposed in the Spencer bill.

Hundreds of leading physicians, surgeons and specialists in and about Boston, Mass., have signed a petition to the State Legislature in which they ask relief from the present Federal restrictions on the manufacture, prescription and sale of alcoholic beverages for medicinal purposes.

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**Mississippi.**—The Legislature has under consideration, with a fair presumption of its passage, a law appropriating $20,000 for work in venereal diseases. A State Detention Home is also considered as one of the probable outcomes of present legislation.

✚

**New Jersey.**—The New Jersey State Chamber of Commerce has been instrumental in introducing into the State Legislature four bills for the control of venereal disease.

1. A bill to amend the marriage law, which will prevent the issuance of marriage licenses to persons suffering from gonorrhea and syphilis.

2. A bill for the issuance of certificates to prospective applicants for marriage licenses limiting the fee to a maximum of $10, and providing for certification at public expense.

3. A bill to amend the existing venereal disease reporting bill to allow the names of persons reported to the State Department of Health to be disclosed to interested health officers for follow-up work.

4. A bill to give the representatives of the Surgeon General of the United States Public Health Service the power of control over carriers of venereal diseases, which control is now, by New Jersey law, limited to the representatives of the Surgeon General of the Army or Navy.

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**New Mexico.**—By the signature of Governor O. A. Larrazolo, the health levy bill fostered by the New Mexico Public Health Association has become a law. The bill received a favorable report by the senate finance committee and was passed by that body, 17 to 5, with only a few amendments. The house judiciary committee presented a unanimous report favoring the passage of the bill with the senate amendments. The bill carried in the house 36 yes and none no. The bill allows the governing bodies of counties and cities to make special levies of not to exceed one-half mill in excess of limitations for health work.

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**New York.**—The Chamber of Commerce of the State of New York, at its regular monthly meeting in April, put itself on record by the following vote: Resolved, That the Chamber of Commerce of the State of New York is opposed to the passage of what is known as the Davenport Bill, Introductory Bill No. 986, and urges upon the members of the Legislature the duty of opposing its enactment into a law. The title of the bill is, "To conserve the human resources of the state by establishing for employees a system of mutual health insurance funds." The bill if enacted would make health insurance compulsory upon practically every employee in the state without physical examination. The Chamber of Commerce is convinced that compulsory health insurance attacks the problem from the wrong point of view and asserts that it is opposed to public policy in a number of ways, that it is a delusion, that it does not promote the health of the individual and that experience abroad had shown its fallacies.

There is now pending in the State Legislature the Sage-Machold bill, to establish a state-wide system of health centres. This provides for annual State grants for the construction of hospitals and their clinics and for the operation of these, the amounts paid to supplement local funds appropriated by the communities. Provision is made for pay patients, whose fees will contribute towards the maintenance of health centers. It further authorizes the establishment of health centers by a city, a county, or a consolidated health district. The effect of the bill will be to make more available the medical and surgical re-

sources of the state, to standardize medical service and to effect its better distribution. The health centers will bring to the doors of those who need them the services and ministrations of physicians, scientists and nurses, which are today available only to persons of considerable means and living in or near the large centers of population.

In discussing the measure Homer Folks, Secretary of the State Charities Aid Association of New York, stated that the bill is "epoch-making." He considers it the most important and progressive health measure since the enactment, in 1913, of the new Public Health Law of the state which has since become a model for many other states. "The bill recognizes," said Mr. Folks, "that it is to the public interest that every citizen receive intelligent medical attention; that it is a public calamity when preventable disease is not prevented or curable disease is not cured; and that only vigorous, efficient, organized public action can correct the serious evils which now exist."

Five State Departments have united to seek from the present Legislature an overhauling of the laws of New York State relating to children. The ideas of the departments of Education, Health, Charities, Probation and the Industrial Commission have been crystallized in a bill introduced in the Senate by Senator Charles W. Walton of Kingston, and in the Assembly by Assemblyman Marguerite L. Smith of New York. This bill creates a Children's Code Commission consisting of two senators, three assemblymen, five persons representing the State departments, and five citizens to be appointed by the Governor to make a thorough study of the confused, conflicting and scattered laws relating to children, with a view to revising the statutes and modernizing the methods of child care throughout the state.

In the words of the bill, the Commission "shall collate and study all laws relating to child welfare, investigate and study the operation and effect of such laws upon children, ascertain any overlapping and duplication of laws and of the activities of any public office, department or commission thereunder, and make recommendation to the Legislature of remedial legislation which it may deem proper as the result of its investigations."

The following have been pointed out as faults in the existing children's laws of New York State:

The laws are negative rather than constructive, and are diffused, indefinite and contradictory. As a whole, they are merely patches upon old laws based upon the theory that all poor persons, including children, were to be committed by town overseers of the poor to almshouses for support. Almost every section has been enacted separately, with little consideration of other provisions, and without any definite plan for complete child protection. Important passages are obscurely hidden in unexpected sections, and are located with difficulty. Definitions of terms are omitted entirely, or are inadequate.

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**Ohio.**—An amendment to the occupational disease reporting law provides a penalty for physicians who refuse or neglect to report occupational diseases to the State Department of Health. The law is effective May 4.

Every physician, the bill states, who is attendant on or called in to visit a patient whom he believes to be suffering from lead poisoning, poisoning from phosphorus, arsenic, brass, wood alcohol, mercury or their compounds or from anthrax or from compressed air illness and such other occupational diseases and ailments as the State Department of Health shall require to be reported must make such report to the State Health Commissioner within forty-eight hours from the time of the first visit. In this report must be the name of the patient with his address and occupation and also the name, address and business of his employer and the nature of the disease.

The amendment declares, "Whoever, being a practicing physician in the state of Ohio, neglects or refuses to make and transmit to the state commissioner of health any report provided for in section 1243-1 of the General Code (which names the diseases to be reported) shall be fined not to exceed $100 or imprisoned for not to exceed 90 days, or both, but no person shall be imprisoned under this section for a first offense and the prosecution shall always be as and for a first offense, unless the affidavit upon which the prosecution is instituted contains the allegation that the offense is a second or repeated offense."

These reports are to be made on, or in conformity with the standard schedule blanks provided by the State Department of Health. Above blanks can be obtained from the State Department free of cost—upon request.

## STATE HEALTH NOTES—GENERAL

**Alabama.**—The twelve points of attack in the anti-tuberculosis program for Alabama include the following:

1. Help the Children: It is in childhood that the seeds of tuberculosis are sown. Teach hygiene by the Modern Health Crusade method.

2. Work for better housing and feeding and living conditions, at home and in school.

3. Watchfulness of children who show any signs of consumption. Open air schools for suspected cases.

4. An Anti-Tuberculosis Association in every county and large town.

5. Supervision of returned soldiers found to have tuberculosis.

6. Preventoria for anaemic children with inadequate home care.

7. A visiting nurse to reach every tuberculosis patient, so as to cheer the patient, instruct the home, promote recovery and insure safety.

8. Training in healthful occupations of persons recovering from tuberculosis.

9. A traveling dispensary, with doctor, nurse and exhibit, to reach remote districts.

10. Free expert examination of all needy cases of suspected tuberculosis.

11. Promotion of hospitals at public expense, to care for advanced and dependent cases of consumption.

12. A sanatorium available for all early cases, however poor, however proud.

Help us put it across—money talks!

The Alabama Bureau of Venereal Disease Control has ten clinics, see table below. In addition the following plan is used to reach the smaller centers:

The Bureau offers to furnish the salvarsan, mercury, etc., and the necessary equipment for the administration of salvarsan, and to teach the physician the technique if he is not already qualified.

The physician agrees to treat at the nominal fee of $2.00, thus placing a complete course of treatment in reach of all at about the usual cost of one "shot of 606." It is the purpose of the Bureau to secure the cooperation of one physician in each center of population. Thirty appointments have been made to date.

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**Arkansas.**—The seventh annual Conference of the health officers of the State was called to order in Little Rock on March 25, 1920, the sessions extending over into the next day. In addition to his speech of welcome, State Health Commissioner C. W. Garrison, M. D., discussed "Morbidity Statistics," and Dr. C. W. Goddard, State Health Commissioner of Texas, addressed the company, telling them "The Way We Do Things in Texas." Col. A. Murray, medical officer in charge of Camp Pike, was one of the speakers, and altogether there were 19 papers and addresses, the titles of which, together with the speakers, are here given:

Mortality Statistics, Mrs. Mary Ellis Brown; How the Arkansas Public Health Association Can Assist Health Authorities, Miss

COMPARATIVE WORK OF ALABAMA FREE CLINICS, FEBRUARY, 1920

| City | New Admissions | | | | | | | | Total Patients | Doses Arsph. | Total Treatments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Syphilis | | | | Gonorrhea | | | | | | |
| | Male | | Female | | Male | | Female | | | | |
| | W | C | W | C | W | C | W | C | | | |
| Anniston | 2 | .. | .. | 2 | 6 | 8 | .. | 8 | 139 | 10 | 506 |
| Bessemer | 2 | 18 | 1 | 3 | 5 | 8 | .. | 2 | 55 | 42 | 171 |
| Birmingham | 51 | 126 | 16 | 71 | 41 | 41 | 13 | 21 | 628 | 525 | 2322 |
| Florence | 3 | 4 | 1 | 2 | 9 | 10 | 3 | 4 | 90 | 50 | 554 |
| Huntsville | 8 | 5 | .. | 2 | 2 | 10 | .. | .. | 111 | 89 | 377 |
| Mobile | 13 | 26 | 7 | 14 | 22 | 37 | 18 | 21 | 228 | 128 | 2027 |
| Montgomery | 1 | 17 | 1 | 9 | 9 | 13 | 3 | 1 | 144 | 100 | 470 |
| Talladega | 8 | 5 | 3 | 2 | 2 | 16 | 7 | 2 | 160 | 87 | 509 |
| Tuscaloosa | 5 | 32 | 1 | 13 | .. | 4 | .. | .. | 145 | 185 | 407 |
| Riderwood | 2 | 4 | .. | .. | .. | 3 | .. | .. | 10 | 10 | 30 |

Wassermanns 822.

| | Syphilis | Gonorrhea | Chancroid |
|---|---|---|---|
| Cases Reported by Doctors | 167 | 220 | 19 |
| Reported by Clinics | .... | .... | 18 |

Total Cases Reported by Clinics ..... 1905
Total Patients Reported by Clinics ..... 1710
Total Treatments Reported by Clinics ..... 7463

Letters Mailed ..... 36950
Bulletins Mailed ..... 54431

W. C. BLASINGAME, Director Bureau V. D. Control.

Erle Chambers, executive secretary, Arkansas Public Health Association; Securing Coöperation, Dr. D. Norton; Venereal Disease Publicity, Mrs. J. O. Blakeney; Publicity and Human Health, Mr. Clio Harper; Relation of Local Health Officers to Venereal Disease Control, Dr. J. T. Clegg; Keeping Fit, Mr. John L. Hunter; Necessity for State Supervision of Public Health Nursing, Miss Linnie Beauchamp, state supervisor, Red Cross; Water and Sewage Disposal, Mr. M. Z. Bair; How Health Officers and Railroads Can Coöperate, Mr. H. W. Van Hovenberg, sanitary engineer, Cotton Belt Railroad; Malaria Control in Arkansas, Dr. F. M. Faget, U. S. P. H. S.; Organization of Clinics, Dr. C. M. Lutterloh; What Constitutes an Efficient Health Department, Dr. John Thames; Instructions as to Collection and Transmission of Specimens, Dr. M. King; and Legal Powers of Arkansas Health Authorities, Judge John W. Wade.

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**Connecticut.**—Announcement is made of the organization of the Health Center in New Haven, Conn., under the combined leadership and financial support of the four chief health agencies of the city, the Municipal Department of Health, the Visiting Nurse Association, the New Haven Chapter of the American Red Cross, and the New Haven Medical Association.

The Health Center will aim to build up the health as well as to detect the physical defects of the 20,000 inhabitants in the selected district, who are largely Italian stock. Free medical examinations, nursing care in the home, and intensive educational work will constitute the main lines of activity. Medical treatment will not be given at the Center, but individuals will be referred to the abundant medical facilities of the city. It is expected that the Health Center will be in full operation by July 1. Its temporary quarters are 194 York street.

The Board of Control is composed of the following members: Prof. C. E. A. Winslow, chairman; Dr. F. W. Wright, health officer; Mr. A. T. Hopkins, treasurer; Drs. C. J. Bartlett and N. Mariani of the Board of Health; Miss M. T. Dana and Mrs. L. M. Daggett of the Visiting Nurse Association; Mr. Thomas W. Farnam and Mrs. E. O. Buckland of the New Haven Chapter, American Red Cross, and Drs. R. B. Beck and F. M. Sperry of the New Haven Medical Association. The director of the Health Center is Mr. Philip S. Platt, M. A., C. P. H.

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**Delaware.**—About 100 citizens of Delaware, interested in public health, met at the capital, Dover, on March 10, and effected a permanent organization entitled, The Delaware Public Health Association. The following were elected to serve for officers during the coming year.

President, Henry Ridgeley; vice-presidents, Henry P. Scott, Mrs. H. D. Boyer, O. A. Newton; secretary-treasurer, A. D. Warner, Jr.; executive committee, Mrs. Ella C. Emery and Albert Robin, M. D.

No one of these officers is an executive officer or employe of any of the boards of health in the state, the idea being that of a democratic, public organization composed of citizens, an organization of the people themselves.

The business of the meeting consisted in the appointment of a Committee on Constitution and the selection of the date, June 2, for the ratification meeting, which is to be held in Wilmington. Representatives of a dozen boards and societies spoke to the gathering, explaining the work of the different societies, the general tenor of the addresses being suggestions towards coöperation. In addition to the local speakers, Assistant Surgeon General T. Clark of the U. S. P. H. Service outlined the health work of the service.

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**Georgia.**—The Venereal Disease Control work in Georgia has been keeping pace with its program in the State very well. The interest in the county unit plan has been intensified and the representatives of the State Board of Health in their respective counties are doing great work. The Department of Venereal Disease Control has mailed to the physicians a supply of report blanks in the past few weeks. It is hoped that physicians will be prompt in making reports. The law is given on the cover of the book of forms, and it is believed that reports on venereal diseases will soon reach a satisfactory basis. It is the law, and it is the physician's duty to report his cases. The "Keeping Fit" exhibit has been demonstrated to 12,734 boys in the state in the past month. Thirty-five lectures were delivered and much interest shown. An exhibit for girls is being perfected, and will be put on the road. A great deal of work is being done in

an educational way in Georgia with the young boys of the state along the line of sex matters.

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**Indiana.**—The State Board of Health has recently issued a series of little folders addressed to the mothers of Indiana. These present in very popular and attractive form a number of messages in the interests of babies who are to have full health and development. One set of rules is that given by the baby to its mother, another group suggests the advice that a competent physician would give to the mother. Other taking features are to be seen in the folders, notably an attractive picture for the first page.

There are ten rules that Baby is supposed to suggest to its mother that seem to be worth wider distribution than the limits of any one state.

BABY'S RULES FOR MOTHER

1. Bathe me every day. Oftener in hot weather. Test the heat of the water with your elbow. Pat me dry. Then I'll laugh and crow for you.

2. Keep me in a cool, clean, airy place. Dirt and heat make me ill and cross. Out of doors let me watch the sunlight and shadows dance. But shield my eyes from a direct light. It hurts them.

3. Let me sleep sixteen to twenty-two hours out of twenty-four. I detest waking to show auntie the color of my eyes. When I sleep, I grow. That is my business.

4. Feed me REGULARLY at three to four hour intervals. My stomach needs to rest between times If you give me too much I'll spit it up. I like mother's milk the best of any.

5. Let me kick and cry sometimes. I MUST get some EXERCISE. Play gently with me, but do not toss me high. I may fall and break my bones.

6. I love to cuddle in your arms, but please, mother, rocking me to sleep makes me dizzy. Turn me over often. I am vain about the shape of my head.

7. Let me hear soft tones of beautiful music. They soothe me. Sudden, loud or harsh noises get on my nerves. I love to hear you sing.

8. Support my head and back while I am tiny. PLEASE let me take my own time in learning to walk. I want my body to grow straight and strong.

9. Do not expect me to talk too soon. It takes quite a while to learn your foreign language. I can understand my own much better and I must think and think before I speak.

10. Protect me from persons who want to kiss my mouth. I am not strong enough to fight all their germs. Besides, it isn't done in the BETTER BABIES' families.

Keep all these rules for me and some day I may do something for you.

Yours for health and happiness,

BABY.

More recently the State Board of Health has issued "The Indiana Baby Book," a most attractive publication worthy of consideration and review as a real book.

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**Kansas.**—In the January Bulletin of the Kansas State Department of Health there is a little article on influenza masks headed "Bite the Knot." The reviewer recalls several practical nurses in an Emergency Hospital at Charleston, West Va., who literally "bit the knots." On account of the scarcity of influenza masks, these were washed and sterilized and used again. As many of the knots for tying the masks around the head were hard knots, the nurses picked them out with their teeth. Then a few days later, when they came down with influenza, the question arose whether the mask had any value at all. There are a great many such insidious and unconsidered ways that the organisms are waiting to take advantage of if the opportunity is afforded. Nature does not waste any time in considering what to do, it presents the most perfect example of the principle, "Do it now."

A bulletin of the same department states that probably 50 trained public health nurses could be placed in Kansas were they only available. It further points out that the time has come when every county and every municipality of importance should have one or more thoroughly trained, competent public health nurses as an integral and permanent part of its health organization. No work has been productive of such immediate results in mitigating human suffering among the poor, and the prevention of sickness and premature death has been attained through the rapid strides made by the public health nursing.

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**Kentucky.**—The August, 1919, Bulletin of the State Board of Health is devoted entirely to pellagra. The cause and prevention are

discussed, and pellagra-preventing bills of fare are given. It is pointed out that in six states alone in 1916 pellagra caused some 3,700 deaths. As its fatality rate is probably not in excess of 5 per cent, the disease must rank practically first in importance as a cause of sickness and lowered physical efficiency of the people in the area affected. In six years pellagra caused the death of 865 people in Kentucky. So it can be seen that the disease represents a distinct public health problem for this state, even though the state is ordinarily considered too far north to be in the pellagra area.—(*M. T.*)

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**Maine.**—Dr. L. D. Bristol, State Commissioner of Public Health, in emphasizing the fact that guarding a city's or town's health is a full-time job, briefly summarizes in twelve points the duties of a full-time health officer, which duties indicate to every thinking man and woman the necessity for having some responsible person qualified to perform them. They are:

1. First and most important to receive regularly from all physicians reports of births, deaths and contagious diseases.

2. Quarantine for diphtheria, scarlet fever, smallpox, infantile paralysis and other diseases must be rigorously enforced when the cases first appear and vaccination against smallpox must be systematically done. Thorough cleaning of the premises after the death or recovery of the patient is imperative.

3. Water supplies must be carefully safeguarded and analysis made to see that all water used for domestic purposes is unpolluted.

4. Sewage disposal must be made as perfect as possible, as contagious diseases are spread from this source.

5. Nuisances, such as stables, pig pens, bad drains, etc., must be given attention.

6. Milk must be inspected.

7. Food of all kinds and soft drinks must be inspected for careful handling and sanitary conditions where they are made and sold.

8. Baby welfare, especially among the poor, must be religiously looked after.

9. Schools must be inspected and defects in children discovered and if possible corrected.

10. Housing conditions of the poor must be remedied. Conditions making for dirt, dampness and disease must call for the health officer's attention.

11. A laboratory should be established where specimens of milk, water and material from people suspected of contagious disease can be examined.

12. Cordial relations between the public and health workers must be established through every existing agency, especially the newspapers as the best informed people are always with the health officer in spirit.

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**Missouri.**—In co-operation with the Missouri State Board of Health, Division of Child Hygiene, the U. S. Public Health Service is making a demonstration of work in child hygiene. Local health organizations, including the Missouri Tuberculosis Association and the American Red Cross are aiding, the former being responsible for the preparation and distribution of much in the way of circulars and notices.

Missouri was chosen for the first work on this line by the government, it was stated, because conditions in Missouri were generally typical of the remainder of the country and also because the state legislature had provided for a state child hygiene bureau to work with and coöperate with the government in this campaign.

There will be six practical lines of work undertaken by different combinations of the coöperating agencies, the first of which is a field investigation. This is to be a house-to-house census by the U. S. P. H. Service and the State authorities in matters of birth registration, enrolling of children of pre-school age and parental supervision. Under the head of school hygiene, the physicians, nurses and teachers will undertake physical examination of the children, height and weight recording and a modern health crusade. Health centers are to be provided in which all the agencies will combine, and these will require a full-time health officer for each of them with a staff of Red Cross and Tuberculosis Society nurses. The various communities will arrange to furnish office and clinic rooms. Especial efforts will be directed towards the establishment of a good system of birth registration, literature will be supplied by various agencies, the Agricultural Extension Service here helping by pamphlets on the nutrition of children, and health education of the people is planned by means of adequate publicity.

In conducting the demonstration in Missouri each community will be asked to make the work permanent, particularly that part of the

work which provides for a health officer continually on duty in the community, and for the regular examination and treatment of the children.

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**New York.**—The State Department of Health devotes a large portion of its *Health News* for February, 1920, to cancer, presenting a comprehensive article on the subject written in collaboration by ten specialists. This emphasizes the principles of early recognition and treatment as the real hope. The headings of the successive paragraphs in the main discussion suggest the thoroughness of the consideration of the subject. First there is the fact of the increase in the mortality and that cancer causes one death out of every 10 in persons above the age of 40 years. It is increasing apparently throughout all civilized countries, the annual increase in the United States being about two and one-half per cent.

The principal means of fighting is education of the people, impressing on every one the fact that on the detection of certain symptoms there should be no delay in going to a physician for examination. The disease is not contagious and not hereditary. There are certain known predisposing conditions which should be avoided, such as irritations, pigmented warts and the like, which by one cause or another are kept more or less constantly sore. Information regarding such matters, together with the somewhat detailed considerations of cancer in different portions of the body, together with a group of conclusions, form a treatise on the subject that is most valuable.

In Greenwich and Easton an inspection of the schools has been carried out by the health officer, Dr. Lewis R. Oatman, who thus reports on the findings of his investigations:

"Have examined 16 district school buildings (all of them in the town of Easton). All in comparatively good condition. Every schoolhouse has a drinking fountain with faucet, and each child its own drinking cup, and in all the schools have impressed the children with the necessity of always using their own. Have urged all trustees to install muslin screens for at least two or three windows and have advised teachers the best way to get good ventilation without draughts. There have been no serious epidemics the past year. This is wholly a rural town. No settlement large enough to be called a village.

"Investigated building for suitability for school building, while new building is being erected. Have investigated school buildings in town of Greenwich urging all trustees to install drinking fountains. Investigated water supply at Thomson school and sent sample to State Department. Conducted State Engineer to same supply later and he also took samples. Met with trustees of said school twice in considering a new water supply for said school. Also its heating and ventilation. Investigated installation of chemical closets for large rural school. Investigated Stevens and Thomson paper mill water supply (drinking). Sent sample to state laboratory."

Athens protects the public against fake remedies. The following regulation is incorporated in the Sanitary Code of the village of Athens, N. Y., and has been enforced for the past two years.

"Regulation 10. No corporation, association, firm or individual shall sell or offer for sale in the Village of Athens, N. Y., any medicine, or so-called remedies, or any so-called medical appliances other than by licensed pharmacists and physicians, unless before offering their commodities for sale they shall receive a permit from the local health officer.

"Any wilful violation of this regulation shall be punishable by a fine of $50.00 for each offense."

Tests of air in one of the factories at Niagara Falls, conducted by officers of the U. S. Public Health Service, revealed the fact that each cubic foot of air contained more than 200,000,000 tiny particles of dust, almost as hard as diamond dust and extremely dangerous to the lungs and air passages.

✣

**North Carolina**—The North Carolina State Department of Health is conducting a far-reaching campaign for improving the condition of the teeth of the school children of the state. Three years ago a complete medical inspection of 3,847 school children in one county revealed 1,187 who had serious decay of permanent teeth, and 315 who were badly in need of operations for the removal of diseased tonsils.

The dental work is conducted without regard to the ability of the patient to pay. Skilled dentists are being sent into rural communities with the instructions to care for all teeth, regardless of the financial status of the parents. The North Carolina Department

points out that nothing could be more undemocratic, un-American and unchristian than to divide the public into those classes who are able to pay and those who cannot, and then to give service to the latter group only.

Clearly one of the most inviolable duties of the State is to see that every child is given an even start in the race, regardless of class, color, social or financial standing.

A permanent equipment in the high school building of each county, a city-wide organization of capable dentists who should do all the work necessary for all school children between six and 12 years of age in each county every year, can be maintained for a sum of money far less than is now annually spent by the public each day for Coco-Cola and tobacco in North Carolina alone.

✚

**North Dakota.**—During an examination of the school children of the state many defects have been found which the *N. D. Pennant*, a local health publication, sets forth. In one school out of 221 pupils examined by the nurse, 128 had defective teeth and 106 had abnormal tonsils. Of the whole only one child in five was getting a chance to do his best at school, and on the others the public funds were being wastefully expended. In another school of 112 only 16 were found to be without defects, while in a third one the ratio of pupils below full efficiency was approximately the same.

The *Pennant* turns to the real health view of the situation after discussing the economics. It says:

"But the money loss to the nation, staggering though it be, is small when compared with the loss of human life and the lack of human efficiency that is a result of our low standard of health. Let us face the facts and set about removing the lack of knowledge and the lack of the 100 per cent ideal of health which lies back of our present waste of money and greater waste of human life."

The North Dakota State Department of Health has recently adopted one of the most complete sets of rules for the submitting of plans and specifications for water supplies, sewerage systems and garbage disposal systems that there is in any State. Careful compliance with the rules set forth should insure first-class water supplies for North Dakota in the future, and provide many needed remedies to existing plants.

**Ohio.**—One hundred and forty Ohio health commissioners have been appointed assistant collaborating epidemiologists by the U. S. P. Health Service. These are commissioners who have been appointed in both the municipal and general districts of the state under the Griswold health law.

With their appointment they also receive the privilege of using franked mail for their morbidity reports, and these reports may be submitted to the State Department of Health in the franked envelopes. As other districts, which have not as yet appointed their commissioner, make the choice, each will be given the same privilege as the ones now holding it. The men who have been chosen by the U. S. Public Health Service will receive $1 a year for their work.

Franked report cards have been placed in the hands of 8,089 Ohio physicians that their reports of communicable diseases may be submitted to the State Department of Health more quickly than formerly.

With the organization of the State according to the Griswold health law almost completed, there are 405 public health nurses now at work in Ohio, not including nurses employed by industrial plants. Using as a basis the census of 1910 for the state, this gives one public health nurse to every 14,320 population. Of the 88 counties of the state, 33 have as yet no nursing service, although thirteen have made definite provision for the employment of one and are only waiting until one can be found, leaving but 20 counties without any provision for nursing service.

Final plans for the state-wide campaign increasing the efficiency of Ohio youth have been completed by the State Department of Health, working in coöperation with the Y. M. C. A., and thousands of Ohio boys are being taught the "Keeping Fit" lesson. The campaign in Ohio is part of a national movement which is designed to reach every boy in the United States.

This fight was at first directed to boys of high school age only, in the hope that education along this line to younger men would bring about a more effective prevention of the spread of the diseases. Later plans included instructing the older boys and young men of the rural districts and those employed in large manufacturing plants over the state.

✚

**South Carolina.**—C. H. Verner, M. D., health officer of Darlington county, S. C., has

hit upon the plan of interesting the children in the public schools in an anti-fly educational campaign, by offering prizes for the most attractive posters showing the house fly as a carrier of disease. Two sets of prizes of $20, $10, and $5 are offered to the schools of the whites and the negroes, so that six happy school children will be the immediate result, followed by the excitement of a follow-up, practical warfare on the flies. Any pupil of the schools of Darlington county is eligible, the judges will decide without knowledge of the contestant's names and the contest closes in time for its benefits to be exerted during the present fly season. The state distributes literature about the fly to any who request it.

**Texas.**—Following is the personnel of the Texas State Board of Health:

Commissioner—C. W. Goddard, M. D., president State Board of Health and Collaborating Epidemiologist, U. S. Public Health Service.

Heads of Departments: W. H. Minton, M. D., assistant state health officer; Oscar Davis, M. D., director, bureau venereal diseases; Aleck P. Harrison, M. D., director, bureau county health work; V. M. Ehlers, C. E., director, bureau sanitary engineering; Douglas Largen, M. D., director, bureau communicable diseases; M. E. Parker, M. D., director, bureau vital statistics; Mrs. Ethel Parsons, R. N., director, bureau child hygiene and public nursing; G. M. Graham, M. D., director, laboratory; H. L. Wright, M. D., director, bureau public health education.

Whole-Time County Health Officers: H. Garst, M. D., Bell county; H. S. Capps, M. D., Jefferson county; F. P. Smith, M. D., Tarrant county; W. H. Hossler, M. D., Williamson county; Arthur W. West, M. D., Wichita county.

Specialists: George Parker and E. H. Magoon, sanitary engineers; W. E. Hardenburg, in charge of malaria control work; Samuel L. Hildebrand, specialist on fish control of malaria, and J. L. Goodwin, M. D., trachoma specialist, the two last-named being on temporary assignment from the U. S. Bureau of Fisheries and the U. S. Public Health Service, respectively.

Since January 1, 1920, four new bureaus have been added to the State Health Department, viz., Bureau Communicable Diseases, Child Hygiene, Public Health Nursing and Public Health Education. A close coöperation has been established with the U. S. Public Health Service and International Health Board of the Rockefeller Foundation through which very effective malaria control work has been established in three groups of four cities each under the direction of three sanitary engineers who are experts in this line of work. The franking privilege has been obtained from the government for all communicable disease work. An affiliation with the American Red Cross has been established through which a large number of specially trained public health nurses are being placed throughout the state. A very valuable indexical survey of certain selected counties has just been completed which has furnished much important information. The Bureau of County Health Work has just completed the inauguration of five permanent county health departments with whole-time health officers in charge, a yearly budget of $10,000 each and an adequate working staff. It is intended that these five counties shall be the nucleus from which this work will be spread as rapidly as possible over the other counties of the state.

The Bureau of Public Health Education has under its direction the carrying on of the publicity work of all of the bureaus of the State Health Department; getting out pamphlets, literature, health exhibitions and supplying the news of the department to the press.

✚

**Wisconsin.**—The Dane County Medical Society concluded a winter series of five free public lectures on preventive medicine and public health. The last, by Dr. A. S. Lovenhart, chairman of the Court in Pharmacology at the University of Wisconsin, was an appeal for more stringent legislation against fraudulent advertising of alleged cure-alls. "There is no such thing as a patent medicine in the first place," he said, "for there is only one medicine, a remedy for syphilis, that has ever been legally patented. These nostrums are merely protected by trade marks and the majority of them contain nothing save a few well-known substances with a little coloring matter."

In coöperation with the United States Public Health Service, the State Board of Health during March conducted intensive surveys of the 1920 influenza epidemic in selected cities, to gain data for common deductions concerning the course of treatment of the disease. The cities were Antigo, Edgerton, Fort Atkinson, Platteville, Rhinelander and Sparta.

# PUBLIC HEALTH LABORATORY NOTES

Abstracted by Francis H. Slack, M. D., and Mr. James M. Strang.

**The Campaign Against Diphtheria in Belgian Luxemburg.**—In the diagnosis of diphtheria time is lost by the necessity of cultural examination of the swab; direct examination being negative in 80 per cent of cases. Fatty material which is on the swab prevents anything like a representative film of the bacteria present being made. The author proceeds to show how, by improved technique one can obtain about 70 per cent of positives instead of the usual 20 per cent, by direct examination. On receipt of material the swab is inoculated on to serum medium. The tube of medium should contain at least ½ cc. of "condensation water," in which the swab is soaked and then drawn over the surface of the medium in the usual way. The fluid in the soaked cotton wool of the swab is then squeezed out on to a slide by means of flat forceps and spread into a film which is stained by Neisser. Lomrey found that frequently one could judge of the probable result of the examination by the appearance of this fluid; if it proved to be milky in appearance, a positive result was almost invariably obtained and *vice versa*. The presence of a large saprophyte and a mould may give a little trouble owing to their bipolar granules which are stained by Neisser. The presence of two large terminal granules and a smaller central one, equally spaced, shows that one has to deal with true diphtheria.—R. F. Lomrey, *Ann. Inst. Past*, 1919, 717. Abstr. in *Jour. State Med.*, Feb., 1920. (*D. G.*)

✣

**Biologic Principles in Public Health Work.**—According to the author the underlying ideas of almost any public health program are so seductively logical that it is only in recent times that any one has attempted in any systematic and strictly objective way to see what the program is actually accomplishing. The true test of the success of public health programs consists in analyzing what logically ought to happen and what actually is taking place. Intensive investigation of the fundamental biologic factors in the problems of public health are essential to further real progress toward their solution. As an illustration the author abstracts the results of a carefully conducted study on the last influenza epidemic, noting that the primary factor in causing variations between different communities in respect of reaction to the influenza epidemic was the organic fitness of these communities. Communities in some degree organically unsound as indicated by relatively high normal death rates from phthisis, organic heart diseases and nephritis were less able to meet successfully the attack of the epidemic than were those in which these organic diseases were not so prevalent.—Raymond Pearl, *Jour. A. M. A.*, Feb. 7, 1920, 375. (*D. G.*)

✣

**A Method of Standardizng Bacterial Suspensions.**—The opacity of a bacterial suspension is measured by the length of the column of the suspension required to cause the disappearance of a wire loop. By a simple formula the measured capacity is translated into terms of bacteria per cc. and so made comparable with that of other suspensions of the same organism. An instrument for measuring the capacity of bacterial suspensions is described in detail. *Jour. Exper. Med.*, Jan. 1920, 105.

✣

**Grouping of B. Influenzæ by Specific Agglutination.**—Ten strains of *B. influenzæ* were tested for their specific and cross agglutinating powers. Nine of the strains studied had the typical cultural and staining qualities of *B. influenzæ*, the tenth was less regular in its properties. The immunization of rabbits, preparation of antigen and agglutination tests was carried out in the usual manner, the tubes being incubated for 16 hours at 55° before reading.

The cross agglutination tests showed a marked grouping of related strains. Seven of the strains fell into two groups, group one having three strains; group two, four. The remaining strains did not cross—agglutinate, although they reacted to their own specific sera. This work demonstrates the possibility of the grouping of *B. influenzæ* organisms by immunological methods. —Small and Dickson, *J. Inf. Dis.*, 1920, 26, 230.

# HEALTH CENTERS

HAROLD B. WOOD, M. D., DR. P. H.
*Providence, R. I.*

The advantage of coördinate work in public health activities has long been recognized, but systematic coöperation has not been attained. The various associations working along these lines need not only to work in harmony but in coöperation. Each association should be well acquainted with the objects, activities, methods and results obtained by each other association working for the advancement of public health and the improvement of social and industrial conditions. The necessity of harmony has repeatedly been emphasized, yet rarely has there been an attempt made to coördinate the separate agencies, except at some tuberculosis conferences and at meetings of the American Public Health Association.

There are many official and other bodies and associations working for the improvement of public health conditions. These include state and local public health officials, the tuberculosis, child-welfare and public health nursing association, the civic leagues and charity aids. To these should be added the various official bureaus for the inspection of factories and mines,—the former a vast field for most beneficial work but largely a wasted opportunity with misplaced funds in many states, owing to inadequate laws.

Joint meetings of all these bodies should be held frequently to discuss methods for coöperative work in order to prevent the misusing of needed funds and the overlapping of activities and to determine the material assistance which each association can render the others. In unity there is production, and coöperative interest and work will produce a much greater result for the limited available funds. Public health nurses can be of more efficient service when working with an active health department than when working separately. When working with or under the local health department school medical inspectors can better systematize their work, especially as far as the detection and control of communicable diseases are concerned. A tuberculosis association can do better and more systematic work when it has the morbidity and mortality records of the health office available. The same unity of effort is needed between all the other health agencies; and the school, tuberculosis and charity workers can be of material assistance to one another.

The whole object of the existence of these associations is the help of mankind, and the most systematic is the best way to accomplish it. Personal glorification in past deeds and personal credit for accomplishments have no right to be considered; the "job is the big thing" (Pershing).

The problem to solve first is the practical method for coördinating these health agencies. The primary step is the matter of location of the offices of the organizations; the Health Center is the solution.

A Health Center is a building to which the general public may go to learn how to preserve health and from which are operated the various matured plans for protecting the public health. In it should be located the offices of the health officer and school medical inspector, of the tuberculosis association, the child-welfare association, the public health nursing association, of the civic league and charity aid organization, and similar philanthropic health associations. In the building should be a room reserved for health exhibits, always to be open to the public and frequently changed in their display material. These exhibits should treat of certain separate specific subjects, as baby welfare, tuberculosis or industrial accidents and diseases, other exhibits being more general in character. A room, with sufficient seating capacity, should be provided for conferences and public meetings. Where deemed satisfactorily located, the Health Center should be provided with proper rooms and equipment for health clinics at which people may learn how to keep well. These clinics would be equipped for work in infant-welfare, tuberculosis, industrial hygiene, venereal disease and in other public health problems receiving official recognition. In the South, hookworm and malaria clinics would be required. The people are not only examined and perhaps treated for their diseases, but given instruction upon how to avoid and how to prevent the various infectious diseases. Within the building the school medical inspector should establish a medical and a

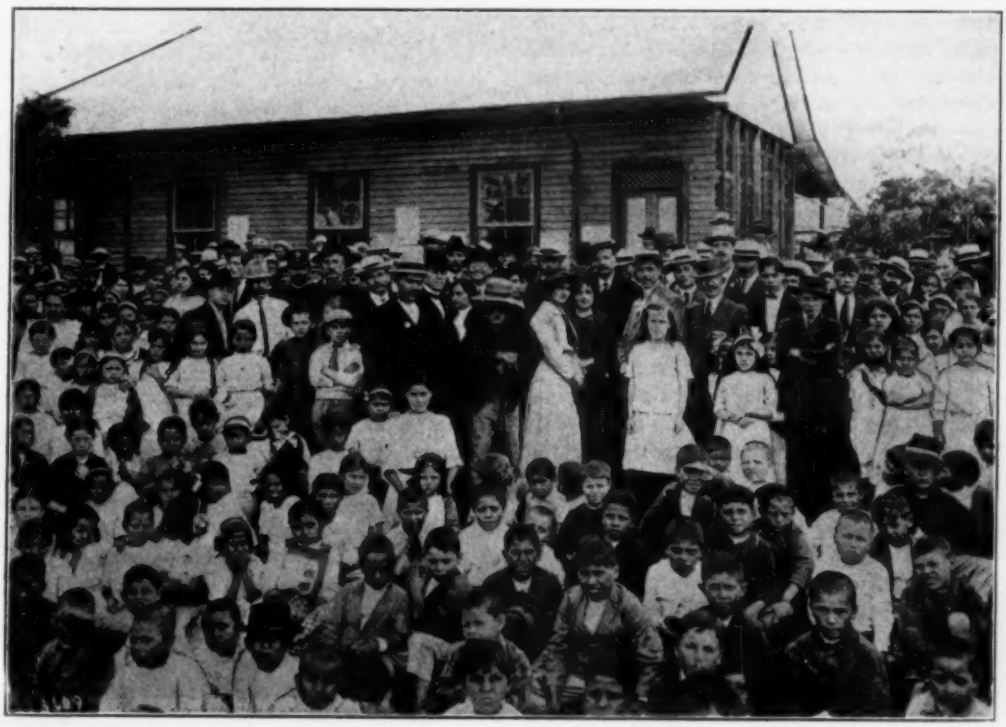
dental clinic for the school children. The city laboratory should be housed in the same building.

The establishment of a Health Center is financially practical. Combining the offices in the same room or building is economic, since a sharing of the expenses for fuel, light and janitor service will save funds. In some localities the municipality furnishes the building. In others, Chambers of Commerce and other business or social clubs, realizing the need and the resulting social and industrial economy, will contribute toward the project.

The Health Center is most applicable for cities from 25,000 to 300,000 population. It is advisable; it is systematizing; it is productive; it is economic. The details of its operation vary with local conditions. Where already established, the Health Center has been eminently successful.

## WORLD-WIDE WORK OF INTERNATIONAL HEALTH BOARD

### COSTA RICA



Anti-hookworm campaigns of the International Health Board and state and national governments owe a large part of their success to the influence exerted by school children. Everywhere the child in school receives a large share of the attention of the staff, and through him the interest of parents and of the community at large is awakened. Here is a group assembled in front of a Costa Rican schoolhouse to hear a lecture on hookworm disease.

Note.—In the JOURNAL for September, 1919, page 645, the heading reads, "Anti-Malaria Measures in Viti," and a reference is made in the text to malaria. There is no malaria in Viti, so that the device is not an anti-malarial one.

# STORIES FROM THE DAY'S WORK

Brief stories of helpful experience are solicited—EDITOR

**Automatic Health Teachers.**—A stereomotorgraph set up in the men's waiting room of the Grand Central Station, New York City, constantly acts as teacher to the group waiting for the 5:15 or some other train. A series of slides depicting healthy methods of living and contrasting them with the unhealthy are automatically thrown on the screen for the benefit of John Doe of Keokuk, Richard Roe of Atlanta, and other men and boys from all parts of the country.

In order to learn the effect of this publicity method a tactful questioner has visited the exhibit at various times and entered into conversation with one or more onlookers, not disclosing his relationships with public health, however, or connecting himself with the exhibit in any way.

One of the first of these talks was with a khaki-clad youth who had done his "bit" overseas and was on his way home to Indiana. "They are certainly making a big fuss about a small matter, aren't they?" was the opening interrogatory assertion advanced by the reporter.

"Say, Buddie; if you believe that syphilis and gonorrhea are small matters you're dead wrong," was the prompt comeback of the doughboy. "I didn't pay much attention to them before I went into the Army—the fellows back home were too blamed ignorant about them and no one told when he had one. In the Army, though, it was different. We were closer to each other and got pretty chummy.

"Then was the time when we all spoke right out in meeting and you would be surprised at the number who owned up to having gotten one of these diseases when they were in civies.

"We learned a whole lot about them in the Army and I'm glad that the men who come in here are getting some straight dope. They need it as much or more than we did."

Similar conversations were had with a number of other ex-service men, most of them agreeing in the sentiments expressed by the first. More than one emphasized the fact that the "wise guy" who used to consider gonorrhea as a joke and syphilis as an exceedingly rare disease, had come out of the Army with real knowledge as to the seriousness and prevalence of both infections.

An elderly white haired man was the next one spoken to. He was busy, apparently, in reading a paper, but as each click of the machine announced a new picture or caption he would quickly transfer his attention to it. "What do you think of the idea," he was asked. "Well," he replied, "it doesn't affect me much, but I was just thinking what a fine thing it is for the boys. There was nothing like it when I was a youngster, but then—these are days when people are realizing that a great deal of disease is unnecessary," his way, undoubtedly, of expressing the more trite "knowledge is power."

Two middle-aged men on a nearby bench were discussing the slides. One evidently disapproved of them. From the portions of his talk which could be overheard, his arguments were to the effect that "such things shouldn't be shown in public," "if a man has one of these diseases it's nobody's business but his own," and "what right has the Government to 'butt in' on them." His companion listened for a while, then slapped him on the back and said, "You've certainly gotten to be a strong believer in 'personal rights,' Bill, since the prohibition amendment was passed." They then went on to their train, but perhaps Bill's companion convinced him that the doctrine of personal rights does not carry with it the right to endanger public health through failure to treat an infectious disease.

At the Pennsylvania terminal where a stereomotorgraph is also installed a negro porter was asked what it was for. When he had described its workings the reporter asked in a scoffing way, "Why don't they fight influenza or some more common disease instead of these?" The porter scratched his head for a moment. Then he answered, "Well, I s'pose it's because there's a *time* for the 'flu' but these other diseases come *all* the time."

"Then again," he continued, "you'd have to be a pretty close friend of my own before

you'd talk to me about syphilis or gonorrhea and I'd have to know you mighty well before I'd listen—but this machine talks *right out loud to everybody.*"

As many as seventy men have been counted, crowded around one of these machines in a railroad terminal and, judging from the typical impressions told of above it seems safe to say that they are agencies of great potential value—agencies which state boards of health and other public and private social hygiene organizations might use to good effect.

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**Making the Sewer Reach the Diapers.**—Dr. E. C. Levy used to say that one reason why diarrheal diseases spread is because the sewer system does not extend to the baby's diaper. It is an altogether too common practice for careless mothers to allow soiled diapers to lie about on the floor, or elsewhere, where flies can get at them and where there is ample opportunity for contact infection. It is the custom in some places, though many health officers do not seem to be aware of this fact, for the nurses to teach mothers to rinse the soiled diaper as soon as it is taken from the child. The diaper is held firmly by the corner and thoroughly rinsed in the water closet, the closet being flushed once or twice at the same time. Of course care must be taken not to let go of it in the closet. It is then put to soak in a pail of water.

C. V. C.

✣

**Experimental Proof of Infection by a Healthy Diphtheria Carrier.**—A large part of the work of Health Officers consists in control by cultures and quarantine of healthy diphtheria carriers, as well as clinical cases. The general public is still very skeptical about the danger of such healthy children causing true diphtheria, and it is comparatively rare that we have reliable evidence of cases caused by such carriers. For this reason I think the following story of two cases of clinical diphtheria caused by a healthy carrier in a family is worth reporting.

This was a Mexican family called A., living in Belvedere which consisted of the following members: Mr. A., age 56; Mrs. A., age 60; Mrs. H., age 35; Maria, age 22; Manuel, age 18; Joe, age 15; Ascencion, age 14, and a baby.

The first case was Mrs. H., who started December 9th. She stayed at home. The two brothers, Manuel and Joe, were away from home at this time, and were not exposed until considerably later. Ascencion, a school child, was found to be a carrier on December 19th, when cultures were taken from all the family for release. She had had no throat symptoms or general illness, but had the signs of a mild nasal diphtheria. The house was still under quarantine and placarded, but in spite of this, Manuel came home January 6th and came down with diphtheria on the 13th. He was quite well when he came home, and it seems tolerably certain that he was infected by his sister, the healthy carrier.

Positive cultures obtained on the following dates from this carrier, Ascencion, proved that she was infectious at this time: December, 19, 23, 29; January 8, 15, 23, 31.

Manuel was promptly sent to the County Hospital January 16th. In spite of this evident result of Manuel's coming into the infected house, another brother, Joe, committed the same folly on the 20th and also came down with the diphtheria in a few days, namely on January 23d. A negative culture was obtained from Ascencion on the 19th, but the two positives obtained just before and after, indicate that she probably was infectious at some time soon after his arrival. This chronic carrier had been treated with the usual mild antiseptics and also silver nitrate 5 per cent, without success until January 31st. On that date and again on February 2d, I treated her nose and throat with a 2 per cent solution of gentian violet, and two subsequent cultures taken on February 2d and 4th were both negative. Apparently this new treatment was effective in her case.

WILLIAM L. HOLT, M.D.,
Los Angeles, Cal.

## GOOD HEALTH AND GOOD CITIZENSHIP

The National Child Hygiene Association of New York City has devised one of the most striking and practical developments in public health education of recent years, in what it terms its "Parcel Post" exhibit. This comes ready for exhibition in a form suitable to almost any possible conditions or space limitations. Here are 25 panels ready for hanging on any handy wall or screen or for exposition in any store window. They are in groups of 5, each group centering about some pithy and important title, such as: "The good citizen is clean," "the good citizen is thrifty," "The good citizen values human life," etc.

They all emphasize the factors to good citizenship which thinkers realize lie in the proper appreciation of hygiene and sanitation.

The panels were prepared by the Association on consultation with specialists and their text is concise, attractive and direct. One group, copies of some of the panels being here reproduced, emphasizes the value of a clean mind in a clean body, the necessity of a clean house and clean premises, and that good citizenship has one of its outward and visible signs in the preservation of a clean city. These panels lay stress on "do," rather than "don't."

and emphasize the need of loyalty and of cooperation for the common good. For those who would like to become missionaries in health education and good citizenship, the Association has placed these sets of panels on sale, demanding for them merely a nominal price.

Your Body
Is Your Mind's House
KEEP IT CLEAN
Brush your teeth twice daily
Don't forget your neck and ears
Wash face and hands before eating

# A. P. H. A. MEETING IN SAN FRANCISCO

## Change of Date

The attention of the members of the American Public Health Association is especially called to the change of date of the Forty-ninth Annual Meeting of the Association. After much consideration it has been set for the five days, September 13-17, instead of the previously announced date at the beginning of September. The fundamental reason for the change was the fact that there would be an important state election in California on September 30. This would have interfered with attendance, would have diverted the attention of many active workers among West Coast health officers from the meeting, and would have interfered with publicity through the press, both before and at the time of the meeting.

Another factor in determining the selection of the days named, September 13-17, was the meeting of the Association of Industrial Accident Boards and Commissioners at San Francisco the week following the A. P. H. A. meetings (September 20-24). It is not unlikely that the Southwestern Tuberculosis Conference will meet at San Francisco the week preceding the A. P. H. A. meeting. If not here it may be at Cheyenne, Wyo., the decision not yet having been made.

Definite announcements with reference to these meetings will find place in the Calendar of Conferences in the June issue of the Journal.

## Special Trains to the Coast

The News Letter for April has already presented the main suggestions with reference to a special A. P. H. A. train from Chicago to San Francisco, with the promise of details in this issue of the Journal.

Chicago is the convenient center for the dispatching of such a train and plans have been formulated for a special A. P. H. A. train to leave the terminal of the Chicago & Northwestern Railroad in Chicago on the evening of Wednesday, September 8, 1920, at 10:30 p. m. Members who intend to take the transcontinental trip with their fellow health workers on the special train must report in Chicago in time to board it, having previously secured their reservations on it. Information with reference to local Travel Chairmen and rates follows.

The route from Chicago to San Francisco has been carefully chosen with reference to climatic conditions, and the itinerary arranged to view the Royal Gorge and its related scenic attractions and the Feather River Gorge, both by daylight and at convenient hours. The itinerary of the special train is the following:

### Itinerary of A. P. H. A. Special Train to San Francisco

| | | | | | |
|---|---|---|---|---|---|
| Lv. Chicago ..... | 10:30 p.m., | Wednesday, | September 8th, | via C. & N. W. | Central Time |
| Ar. Omaha ..... | 12:30 p.m., | Thursday, | September 9th, | via C. & N. W. | |
| Lv. Omaha ..... | 1:00 p.m., | Thursday, | September 9th, | via U. P. | |
| Ar. Denver ..... | 2:00 a.m., | Friday, | September 10th, | via U. P. | Mountain Time |
| Lv. Denver ..... | 2:30 a.m., | Friday, | September 10th, | via D. & R. G. | |
| Ar. Colorado Springs ..... | 4:30 a.m., | Friday, | September 10th, | via D. & R. G. | |
| Pass through the Royal Gorge | | | | | |
| Ar. Salt Lake City | 9:00 a.m., | Saturday, | September 11th, | via D. & R. G. | |
| Spend the forenoon in Salt Lake City | | | | | Pacific Time |
| Lv. Salt Lake City | 2:00 p.m., | Saturday, | September 11th, | via S. Pac. | |
| Ar. San Francisco | 6:00 p.m., | Sunday, | September 12th, | via S. Pac. | |

This itinerary is a special one for the A. P. H. A. train, and cannot be checked up by the regular folders of the railways. The scenic attractions include Colorado Springs, Pikes Peak, Royal Gorge, Canon of the Eagle River, Glenwood Springs, etc. At Salt Lake City a stop-over of five hours is arranged, enabling members to make sight-seeing tours of this interesting city, including the Mormon Temple and Tabernacle, a trip to Salt Air Beach, and perhaps an opportunity to attend an organ recital at the Tabernacle.

## Ticket Rates from Chicago to San Francisco and Return

Going via the above route to San Francisco and returning via Ogden and Salt Lake City,

(*Continued on page* 484)

**It is important to form your party for these special cars at the earliest possible moment.**

# Preliminary Returns of Membership Campaign

NEW NAMES PROPOSED FOR MEMBERSHIP IN THE

# A. P. H. A.

FROM MARCH 13, 1920, TO MAY 4, 1920

NOTE—Names of sponsors are set in **Bold Face** type. Names of proposed members are set in Roman.

*Asterisks indicate memberships received before the beginning of the campaign.

## ALABAMA

**Jewell J. Smith, Fort Payne.**
G. H. Dubois, Fort Payne.

**H. G. Perry, M. D., Montgomery.**
R. M. Kimbrough, M. D., Health Officer, Livingston.

**J. Smith, Fort Payne.**
G. H. Dubois, Chemist, Fort Payne.

## ARKANSAS

**Edwin F. Voigt, Fort Smith.**
Susan A. Taylor, R. N., Tuberculosis Nurse, Fort Smith.
*G. May D. V. S., Chief Dairy Inspector Fort Smith.

**C. W. Garrison, M. D., Little Rock.**
*Cyrus F. Crosby, M. D., Heber Springs.
*Thomas Douglass, M. D. County Health Officer, Ozark.
*C. W. Hall, M. D., Greenwood.
*M. E. Howard, M. W., Perryville.
*J. M. Jelks, M. D., Searcy.
*C. H. Newkirk, M. D., City Health Officer Corning.
*J. S. Westenfield, M. D., Health Officer, Conway.
*J. M. Williams, M. D., County Health Officer, Malvern.

## CALIFORNIA

**Margaret Beattie, Berkeley.**
M. Dorothy Beck, Berkeley.

**R. F. Goudey, Berkeley.**
E. A. Reinke, Asst. Engr., State Board of Health, Berkeley.
Charles R. Gerth, Bacteriologist, Betteravia.

**Frank L. Kelly, M. D., Berkeley.**
Edward T. Ross, Chief Sanitary Inspector California State Board of Health, Sacramento.

**Ida May Stevens, Berkeley.**
E. Francis Rodgers, Berkeley.

**Clyde F. Smith, Berkeley.**
Ralph Hilscher, Chief Engr., Cal. State Board of Health, Berkeley.

**F. E. Twining, Fresno.**
John F. McKenna, D. V. S., City Veterinarian, Fresno.
Neal Hultslander, Bacteriologist, Fresno.

**L. M. Powers, M. D., Los Angeles.**
*Irving R. Bancroft, Sec., State Board of Health, Sacramento.

**C. A. Kofoid Ph. D., Oakland.**
Albert H. Rowe, M. D., Oakland.

**Louis Olsen, A. B., Palo Alto.**
Donald W. MacNair, State Dairy Inspector, Saratoga.

**I. R. Bancroft, M. D., Sacramento.**
Rozzie Manning, R. N., Public Health Nurse, Woodland.
George E. Ebright, M. D., Pres., Cal. State Bd. of Health, San Francisco.

**Guy P. Jones Sacramento.**
A. G. Bailey, M. D., Suisun City.
Walter E. Bates, M. D., Health Officer, Davis.
Charles R. Blake, M. D., Commissioner of Health, Richmond.
Stephen F. Butler, Health Officer, Salinas.
M. A. Craig, M. D., County Health Officer, Lakeport.
George W. Desrosier, M. D., Health Officer, Colusa.
Thomas J. De Vaughn, M. D., Health Officer, Huntington Park.
S. P. S. Edwards, M. D., Health Officer, Ontario.
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*(Continued from page 479)*

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**Remember the new date, San Francisco, September 13-17, 1920.**